

X  
EXTRACT FROM CEYLON SESSIONAL PAPERS, XXIV.—1927.



## MUNICIPALITY OF COLOMBO.

### REPORT

XXI

OF THE

MEDICAL OFFICER OF HEALTH,

FOR THE YEAR

1926.

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## APPENDIX C.

## REPORT OF THE MEDICAL OFFICER OF HEALTH FOR 1926.

I HAVE the honour to forward the annual report of the Public Health Department for the year 1926.

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## INTRODUCTORY REVIEW.

*Health of the Population in 1926.*—Although the year 1926, as a whole, was an abnormally wet one, with an excess of no less than 18·70 inches of rain, it was an unusually satisfactory one as regards the state of the public health. Thus the death-rate from all causes amongst town residents (*i.e.*, omitting the deaths of persons who actually came sick to the town and died in the hospitals) was only 23·4 per 1,000, which is the lowest hitherto recorded. As regards the mortality in the hospitals amongst non-residents of the town, it may be mentioned that, as the records kept in this office for the last 16 years show, this has for many years past been a steadily increasing factor in fallaciously keeping up the Colombo crude death-rate. Thus, during the five years 1911-1915 there were, on the average, 546 deaths per annum in the hospitals of non-residents of the town, the exclusion of which reduced the crude death-rate during that period by an average of 2·4 per 1,000 per annum; whereas, in 1926, there were no fewer than 1,399 deaths in the town hospitals of non-residents of the town, the exclusion of which reduces the death-rate by 5·4 per 1,000. In some countries not only those who come sick to the towns, but all who have had less than three months residence in the towns prior to death are excluded when calculating the death-rate. This is, however, not regarded as a justifiable or practicable correction here and is not adopted in the Colombo report. The steady increase in the number of deaths in the hospitals of non-residents of the town is a clear indication of the increasing use which is made of the hospitals by the general population of the Island, and accounts for the frequent reports of overcrowding in the hospitals.

Not only the general death-rate, but also the infant mortality, of 204 per 1,000 births during 1926, is the lowest ever recorded in Colombo. So also the mortality from phthisis, of 2·27 per 1,000, is the lowest on record, even after making due allowance for the deaths from this cause of town residents which occurred during the year in the Lunatic Asylum after its removal to Angoda.

Plague, with only 13 cases and 12 deaths during the year, is much the lowest recorded since that disease appeared in Ceylon in 1914. As explained later in this Report there is reason to believe that plague was eradicated from Colombo during the year, but was re-introduced from abroad by infected fleas conveyed on board grain ships, thence to grain barges, and from there to the granaries and thence into the town.

Although smallpox was imported from India on two occasions during the year, only ten cases, including three imported cases, occurred in the town.

No case of cholera occurred during the year.

The Diarrhoeal group of diseases, including diarrhoea, enteritis, and dysentery, showed a slightly decreased mortality.

Enteric fever, with the exception of one year, viz., 1914, showed the lowest prevalence amongst town residents recorded in any year since notification of this disease was first enforced in 1903.

Chickenpox was markedly less prevalent, and measles also showed a decline compared with the previous year.

Influenza continued to be fairly prevalent, and although, in the main, of a comparatively mild type it was still a considerable factor in keeping up the death-rate, especially the mortality from pneumonia.

There was a recrudescence of dengue in 1926, after an interval of about 20 years since the last and much more severe outbreak of 1906. This agrees with Sir Patrick Manson's observation that dengue tends to recur in epidemic or pandemic form once in 20 years.

The remarkably low general death-rate of 8·8 per 1,000 in the Cinnamon Gardens Ward give some indication of what might theoretically be achieved in the town as a whole, provided that the whole population was equally highly educated and lived under similarly hygienic conditions to those who reside in the Cinnamon Gardens. This is of course a quite Utopian prospect, but it holds out encouragement for future sanitary endeavour.

As regards administration during the year 1926, it may be remarked briefly that the records of work done show increased activity in all the principal branches of the Department, especially in respect of enteric and plague prevention, inspection of dairies, bakeries, and eating-houses, improvement of insanitary dwellings, and the prosecution of child welfare work.

Special attention is invited to the very interesting and valuable report by Dr. L. F. Hirst, the Municipal Microbiologist.

As the writer retires within a few days, after 24 years and 8 months service as Medical Officer of Health of Colombo, this is the last of a series of 21 Administration Reports that he will be privileged to submit.

### Part I.—VITAL STATISTICS.

#### I.—METEOROLOGY.

The year 1926, as a whole, was an abnormally wet one, with a total rainfall of 104·98 inches, as against the average for 19 years of 86·28 inches. This excess of 18·70 inches fell almost entirely during May, June, and July, i.e., the south-west monsoon, 25·95 inches having fallen during May alone, as compared with the average for that month of 13·38 inches. Not only was the total rainfall excessive, but its chronological distribution was such that it greatly favoured the breeding of mosquitoes, which were in consequence unusually prevalent during the year.

##### (1) Statistics.

(Supplied by the Superintendent of the Colombo Observatory.)

(a) Average Monthly Mean Temperature at Colombo Observatory (Cinnamon Gardens). 19 Years to 1926 inclusive.		(b) Monthly Mean Temperature at Colombo Observatory during 1926.		(c) Average Monthly Mean Pressure at Colombo Observatory (Cinnamon Gardens) reduced to Standard Gravity and Mean Sea Level. 15 Years to 1926 inclusive.	
	°F.		°F.		Inches.
January	... 79·1	January	... 79·4	January	... 29·862
February	... 79·8	February	... 80·6	February	... 29·853
March	... 81·4	March	... 82·4	March	... 29·836
April	... 82·6	April	... 83·4	April	... 29·800
May	... 82·6	May	... 82·4	May	... 29·780
June	... 81·6	June	... 82·0	June	... 29·782
July	... 81·0	July	... 81·2	July	... 29·796
August	... 81·1	August	... 81·8	August	... 29·810
September	... 81·0	September	... 81·6	September	... 29·818
October	... 80·4	October	... 81·2	October	... 29·827
November	... 79·6	November	... 79·8	November	... 29·822
December	... 79·2	December	... 79·8	December	... 29·842
Year	... 80·8	Year	... 81·3	Year	... 29·819
(d) Monthly Mean Pressure at Colombo Observatory during 1926 (reduced to Standard Gravity and Mean Sea Level).		(e) Average Monthly Rainfall at Colombo Observatory (Cinnamon Gardens).		(f) Monthly Rainfall at Colombo Observatory (Cinnamon Gardens) and Colombo Fort during 1926. (Observatory Gauge 25 Feet and Fort 70 Feet above Mean Sea Level.)	
	Inches.		Inches.	Colombo Observatory.	Colombo Fort. Inches.
January	... 29·870	January	... 3·45	January	... 2·51 ... 2·41
February	... 29·860	February	... 1·97	February	... 0·14 ... 0·11
March	... 29·851	March	... 4·72	March	... 5·74 ... 6·14
April	... 29·819	April	... 7·99	April	... 2·53 ... 6·07
May	... 29·776	May	... 13·38	May	... 25·95 ... 19·27
June	... 29·787	June	... 8·25	June	... 13·25 ... 11·34
July	... 29·770	July	... 6·71	July	... 11·86 ... 12·66
August	... 29·804	August	... 3·25	August	... 5·31 ... 4·60
September	... 29·790	September	... 6·38	September	... 9·43 ... 6·91
October	... 29·788	October	... 13·09	October	... 12·42 ... 5·43
November	... 29·812	November	... 11·71	November	... 10·23 ... 7·51
December	... 29·802	December	... 5·38	December	... 5·61 ... 2·98
Year	... 29·811	Year	... 86·28	Year	... 104·98 ... 85·43

(g) Average Monthly Mean Humidity at Colombo Observatory (Cinnamon Gardens). 18 Years to 1926 inclusive.

		Per Cent.
January	... ...	77
February	... ...	76
March	... ...	78
April	... ...	80
May	... ...	81
June	... ...	81
July	... ...	81
August	... ...	80
September	... ...	80
October	... ...	82
November	... ...	82
December	... ...	79
Year	... ...	80

(h) Monthly Mean Humidity at Colombo Observatory during 1926.

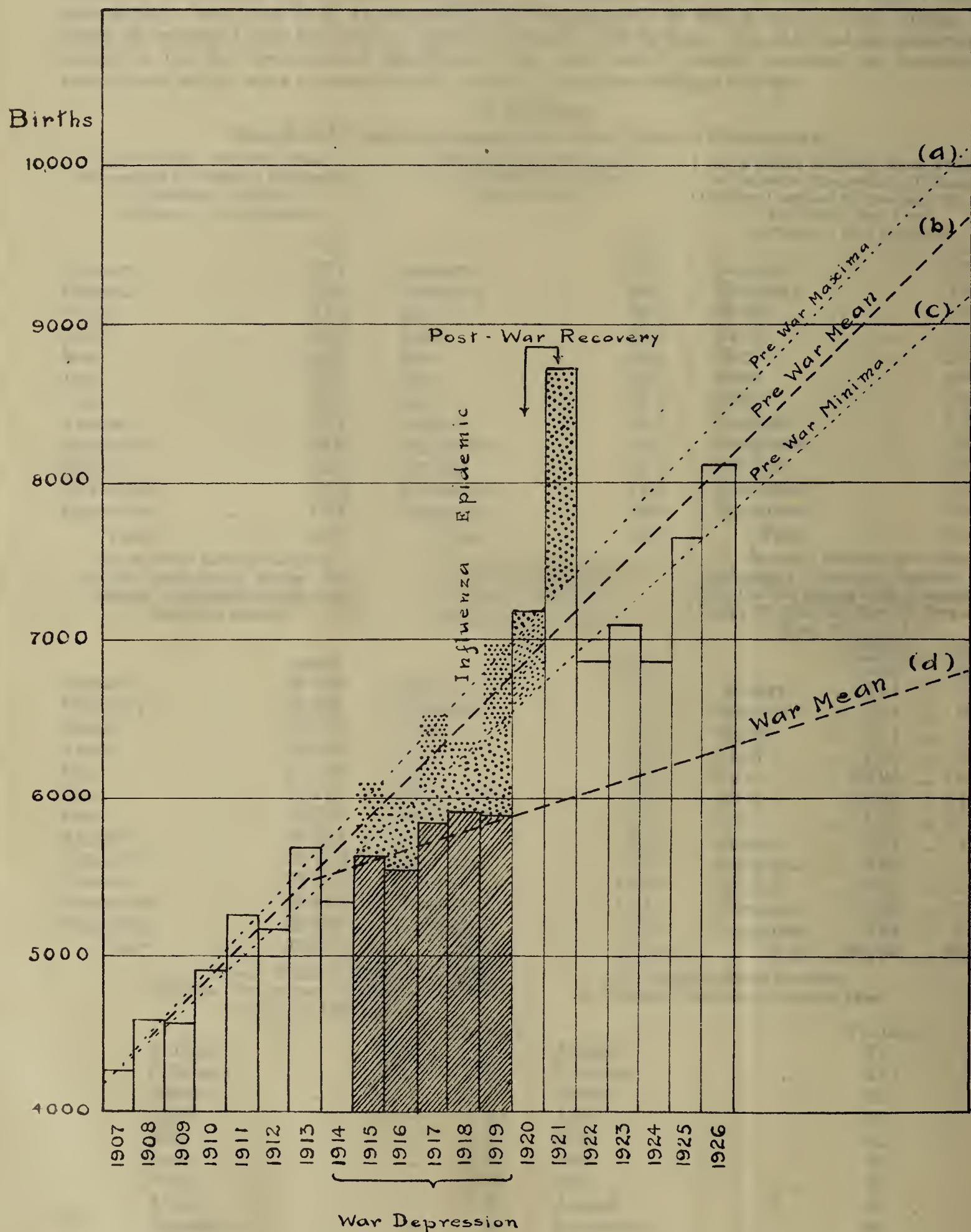
	Per Cent.
January	... ... 76
February	... ... 76
March	... ... 79
April	... ... 80
May	... ... 82
June	... ... 84
July	... ... 84
August	... ... 82
September	... ... 82
October	... ... 82
November	... ... 82
December	... ... 78
Year	... ... 81

DIVERGENCE

## Следственное дело о Годи

DIAGRAM N°I

BIRTHS REGISTERED  
1907 to 1926



### III - NATIONAL

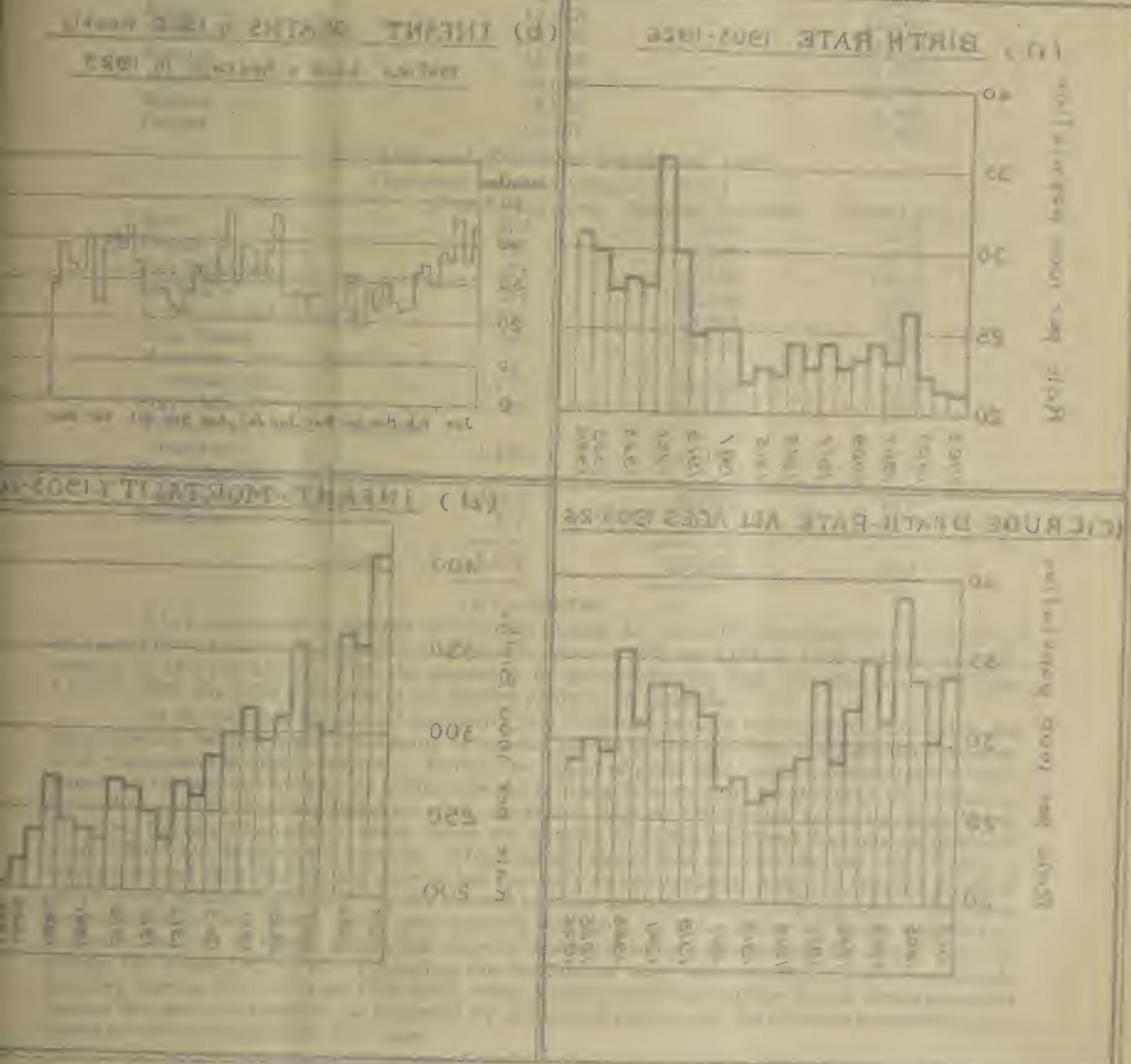
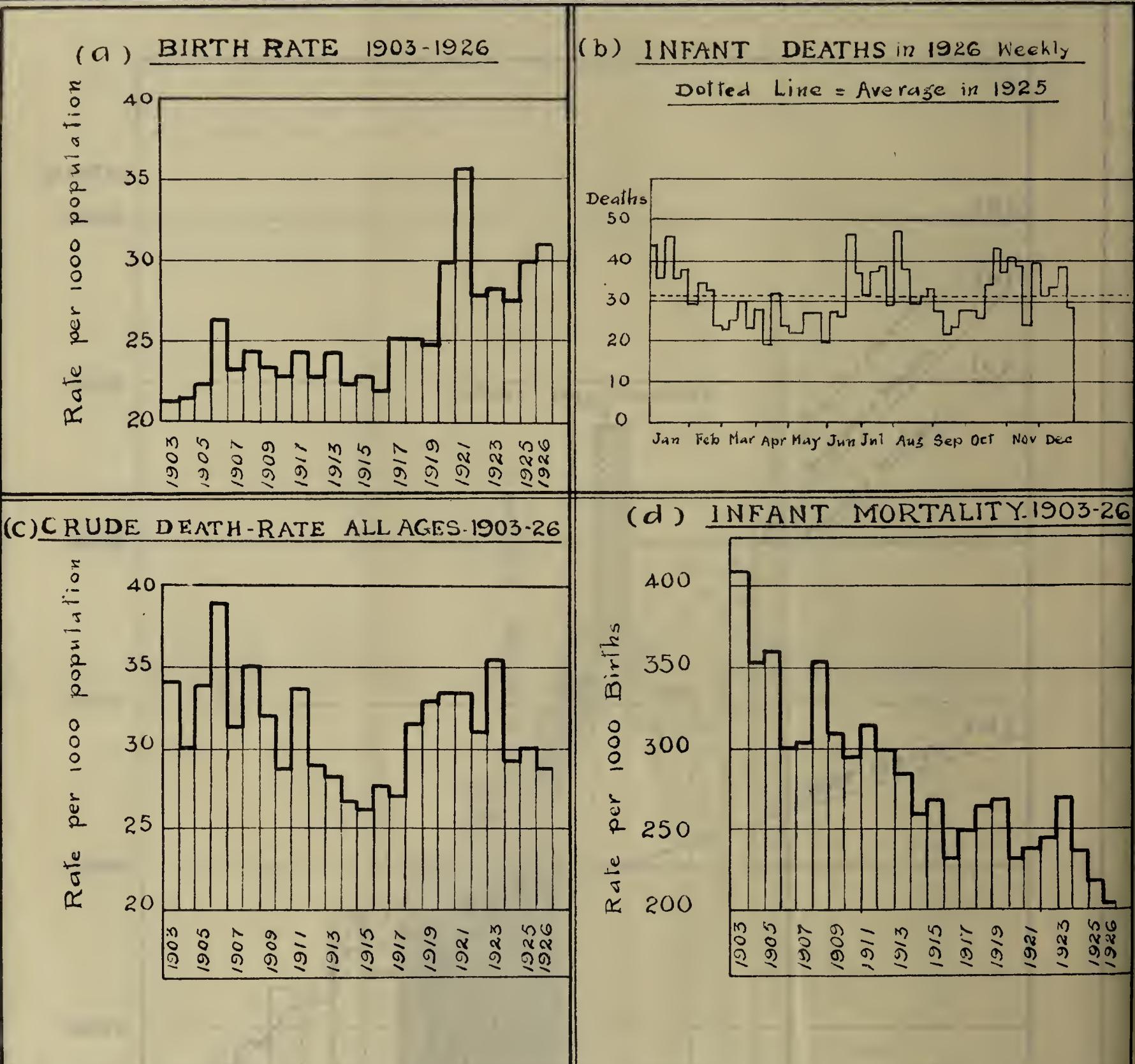


DIAGRAM N° II



With reference to the rainfall at Fort, it should be noted that this gauge is not only higher above sea level, but higher above adjacent ground level, and for this its readings might be expected to be less than those of a gauge at or near ground level. The difference between it and the readings at the Observatory is thus not purely a climatic one, but largely a matter of an exposure of two gauges.

The Observatory gauge should be taken as the standard.

The humidity in tables (*g*) and (*h*) is the mean of the humidities derived from the maximum both dry and wet, and the minimum dry and wet.

## II.—POPULATION.

The estimate of the population at the middle of the year 1926 was 258,907, but this is believed to be a considerable underestimate as it is based on the Census population of 1921, which is known to have been an abnormally small one, as explained in the Report for the year 1924.

### (2) Population by Race.

Race.		Population according to the Census of March, 1921.		Population estimated to middle of 1926.
All Races	...	244,163	...	258,907
Europeans	...	2,836	...	3,007
Burghers	...	14,863	...	15,761
Sinhalese	...	114,600	...	121,520
Tamils	...	54,153	...	57,423
Moors	...	39,692	...	42,089
Malays	...	5,852	...	6,205
Others	...	12,167	...	12,902

### (3) Area and Estimated Population, 1926.

(Estimate based on Census of 1921.)

Ward.		Total Area in Acres.	Estimated Population.	Density per Acre.
Fort	...	237	2,852	12·0
Pettah	...	129	8,060	62·5
San Sebastian	...	121	12,186	100·7
St. Paul's	...	157	24,808	158·0
Kotahena and Mutwal	...	1,716	48,959	28·5
New Bazaar	...	289	24,751	85·6
Maradana North, South, and Dematagoda	...	1,773	61,002	34·4
Slave Island	...	322	22,866	71·0
Kollupitiya and Cinnamon Gardens	...	1,465	25,186	17·2
Bambalapitiya, Timbirigas- yaya, and Wellawatta	...	2,061	28,237	13·7
The Lake	...	317	—	—
<b>Total</b>	<b>...</b>	<b>8,587</b>	<b>258,907</b>	<b>30·2</b>

## III.—BIRTHS.

8,114 births were registered in Colombo during the year 1926, representing a birth-rate of 31·3 per 1,000 of estimated population, as against a rate of 29·9 per 1,000 in 1925 and the decennial average of 27·8 per 1,000. With the exception of the abnormally high post-war rate of 35·7 per 1,000 in 1921, the 1926 birth-rate is the highest recorded in Colombo.

As an indicator of national prosperity, the birth-rate is more reliable in Colombo than the marriage-rate, because legal registration of marital unions is very far from complete here, whereas birth registration is fairly complete. During the period of great social and economical disturbance caused by the war the number of births recorded is probably even more reliable than the birth-rate, because the birth-rate is calculated on what was at that time an abnormally fluctuating population. For these reasons *Diagram I.*, which shows the number of births registered during each of the 20 years 1907–1926, is of special interest. This diagram shows that prior to the war the number of births recorded each year tended more or less regularly to be alternately high and low, the resultant curves being roughly represented by the pre-war maxima and minima curves (*a*) and (*c*). Following the outbreak of war there was a very marked reduction in the number of births recorded in Colombo, the loss of infant population thereby sustained being indicated by the dotted columns during the years 1915–1919. Following the cessation of war, however, there was a remarkable recovery during the two years 1920–1921, when a considerable part of the loss of births sustained during the war was regained, as indicated by the dotted portions of the columns representing the births recorded during these two years.

A certain proportion of the loss of births recorded in Colombo during the war period was without doubt due, not to cessation of marital unions, but to migration of prospective mothers from the town to the country districts. This appears to have occurred especially in 1917, for during that year there was, as the Registrar-General's records show, a very marked increase of births compared with the previous two and the subsequent two years in the Colombo District and in the Western Province generally, whereas in Colombo town the number of births recorded was markedly low. This was, however, a temporary phase, for in the years 1918 and 1919 the births recorded were low, not only in the town, but also in the Colombo District and Province. As regards the sudden increase of births in 1917 in the adjacent country districts, Mr. L. J. B. Turner, C.C.S., the Director of Statistics, suggests that the plumbago boom in 1916 may, by increasing prosperity, have had some influence. From the above data it may be inferred that the reduction in the number of births during the war period is, in the main, an indication of the social disturbance and economic depression which resulted from the war, and that on the other hand the remarkable recovery in 1920 and 1921, although to some extent due to return of the Colombo population, is an indication of renewed national prosperity "as the result of peace after war, abundance after dearth, high wages after want of employment, speculation after languid enterprise, and confidence after distrust."

The experience of Colombo thus bears out in a very striking manner the truth of Dr. Farr's dictum that the marriage-rate (assuming that all marital unions are registered) is the "barometer of national prosperity."

Such remarkable reproduction as was experienced in 1921 could not be expected to continue, and it is, therefore, not surprising to find that the births recorded during the succeeding three years, 1922-1924, failed to come up even to the pre-war standard. The records for the years 1925 and 1926 show, however, that matters have in this respect now practically returned to the pre-war normal. One may, therefore, conclude that Colombo during the year under review had regained the prosperous position which it held prior to the war. This conclusion is indeed strikingly confirmed by inquiries in other directions, e.g., the records of the Post Office Savings Bank, which, according to the figures kindly supplied by Mr. Lovett, the Controller of the Bank, surpassed in 1926 all previous records in the matter of the number of accounts opened, the amount of deposits, and the amount to credit of depositors.

(4) *Racial Birth-rates, 1926.*

Race.	Average Rate per 1,000 Population. 1916 to 1925.	Births, 1926.	Birth-rate per 1,000 Popu- lation, 1926.
All Races	27·8	8,114	31·3
Europeans	27·0	87	28·9
Burghers	35·0	566	35·9
Sinhalese	34·7	4,838	39·8
Tamils	16·5	1,060	18·5
Moors	23·3	1,127	26·8
Malays	43·4	285	45·9
Others	10·6	151	11·7

(5) *Ward Birth-rates, 1926.*

Ward.	Average Rate per 1,000 Population, 1916 to 1925.	Births, 1926.	Birth-rate per 1,000 Population, 1926.
Colombo Town	27·8	8,114	31·3
Fort	2·0	2	0·7
Pettah	3·7	24	3·0
San Sebastian	19·9	278	22·8
St. Paul's	18·5	487	19·6
Kotahena	24·1	584	20·0
Mutwal	24·1	567	28·6
New Bazaar	23·0	649	26·2
Maradana North	20·6	577	25·3
Maradana South	20·6	291	14·8
Dematagoda	24·9	476	25·7
Slave Island	17·7	558	24·4
Kollupitiya	17·7	243	16·0
Cinnamon Gardens	19·3	70	7·0
Bandalapitiya	19·3	180	17·8
Timbirigasyaya	19·3	266	39·9
Wellawatta	—	291	25·4
Hospitals	—	2,571	—

(6) *Stillbirths in Colombo during the Year 1926, by Race.*

Race.	No. of Stillbirths.	Rate per 1,000 Births (Live and Still.)
All Races	610	69·9
Europeans	2	22·5
Burghers	20	34·1
Sinhalese	392	75·0
Tamils	85	74·2
Moors	81	67·1
Malays	20	65·6
Others	10	62·1

(7) *Stillbirths during the Year 1926, by Ward.*

Statement Showing the Number of Stillbirths, by Ward, and the Rates per 1,000 Total Births (Live and Still).

Ward.	No. of Stillbirths.	Rate per 1,000 of Total Births (Live and Still.).	Ward.	No. of Stillbirths.	Rate per 1,000 of Total Births (Live and Still.).
Colombo Town	610	69·9	Maradana South	14	45·9
Fort	—	—	Dematagoda	17	34·5
Pettah	—	—	Slave Island	34	57·4
San Sebastian	17	57·6	Kollupitiya	12	47·1
St. Paul's	45	84·6	Cinnamon Gardens	3	41·1
Kotahena	26	42·6	Bandalapitiya	6	32·3
Mutwal	28	47·1	Timbirigasyaya	9	32·7
New Bazaar	54	76·8	Wellawatta	9	30·0
Maradana North	9	15·4	Hospitals	327	112·8

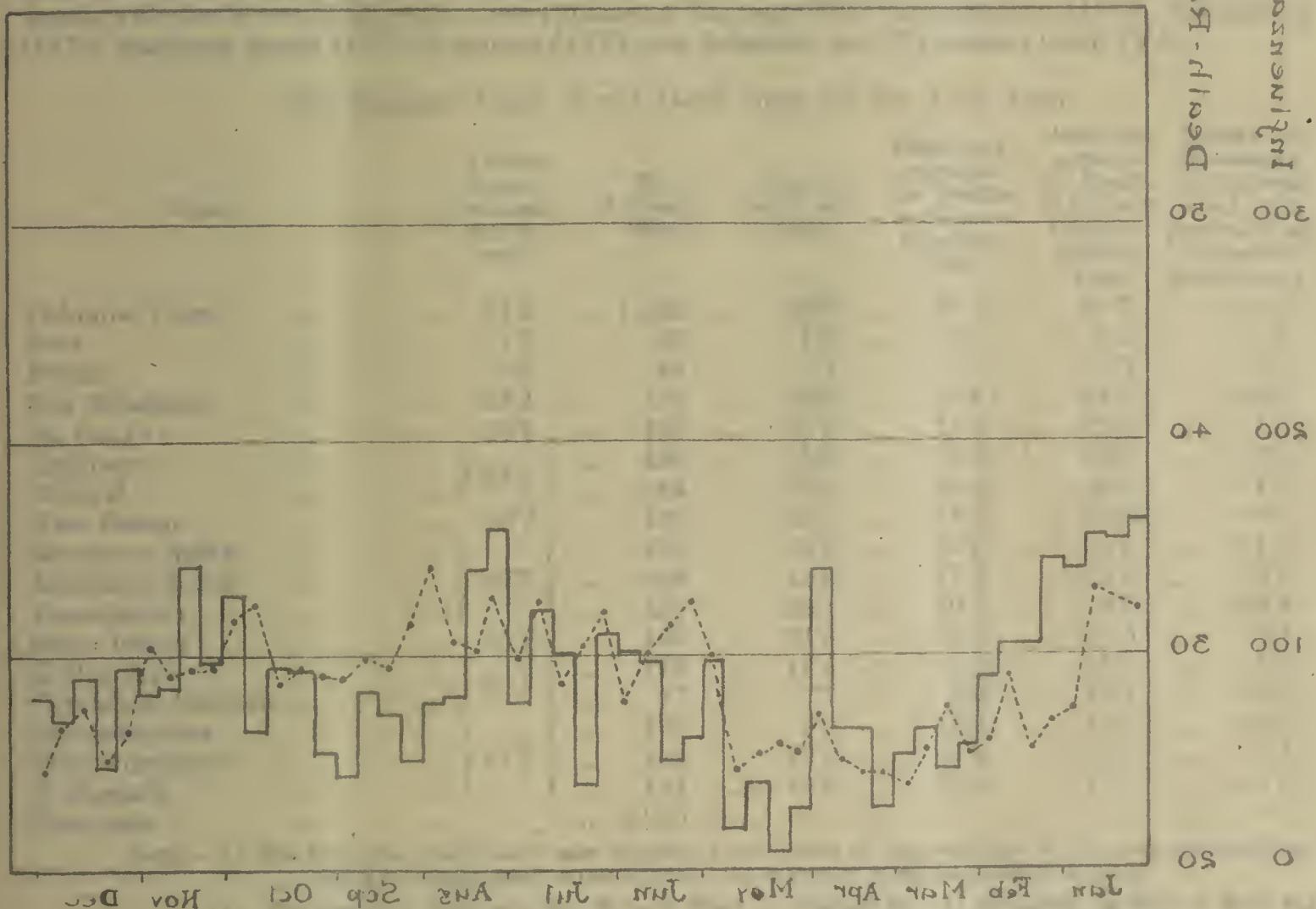
IV.—DEATHS.

The classification of causes of deaths given in this and previous reports is the second revision of the international list as amended to suit local conditions, and adopted by the Registrar-General of Ceylon.

## DIAGRAM N° III

MEERKAT DEATH-RATE ALL CAUSES

1956



FULL LINE = Death-Rate All Causes

DOTTED LINE = Malignant Causes All Diseases

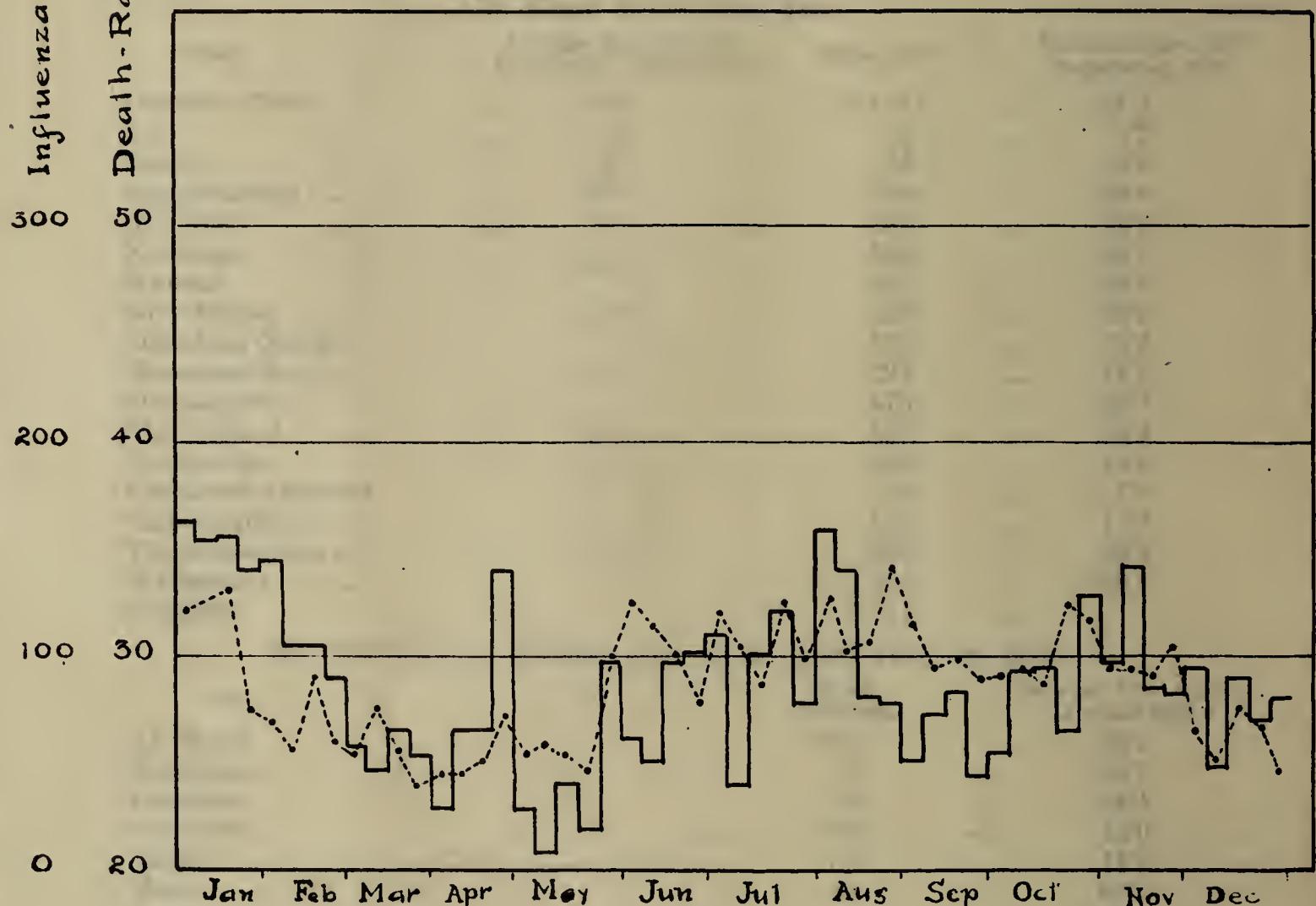
Influenza Cases at Dispensaries

Death-Rate per 1000

### DIAGRAM N° III

WEEKLY DEATH-RATE ALL CAUSES

1926



Full Line = Death-Rate All Causes

Dotted Line = Influenza Cases at Dispensaries

It was hoped that it might be possible, as suggested by the Colonial Advisory Medical and Sanitary Committee, to introduce the third revision in the 1926 Report, but the Registrar-General, who supplies the crude death statistics, and whose forms of classification are used in the Public Health Department with a view of preserving uniformity, has intimated that it will not be possible to introduce the third revision until the 1927 Report is prepared, for the reason that the tabulations for 1926 are already completed.

#### *General Death-rate.*

7,466 deaths (including 1,399 deaths of non-residents who came sick to the town and died in the hospitals) were registered during the year. There were thus 510 fewer deaths of town residents in 1926 than in the previous year. The crude death-rate, reckoned on the estimated population, was 28·8 per 1,000 living compared with 30·2 in 1925, while the rate exclusive of non-residents was 23·4 per 1,000 compared with 25·7 in 1925. This is the lowest corrected death-rate so far recorded in Colombo. As Diagram II. (c) indicates, the rise in general mortality caused by the pandemic of influenza in 1918 was subsequently maintained for six years, but has shown signs of abating during the last three years. As Diagram III. shows, however, influenza is still fairly prevalent amongst the population, and exercises a considerable influence in keeping up the general death-rate, especially as regards the mortality from pneumonia, which is still far above the level at which it stood before influenza appeared. (See Diagram VIII. (b).)

#### V.—WARD DEATH-RATES.

When the deaths of 1,165 town residents, which occurred in and were registered against the hospitals, are allotted to their respective wards of residence, it is found (*vide Statement 8*) that the sanitary divisions with the highest death-rates from all causes and at all ages were Mutwal (30·8), Dematagoda (30·2), Slave Island (26·6), Maradana North (26·0), Timbirigasyaya (25·6), New Bazaar and St. Paul's (each 24·5). Exclusive of the non-residential wards of Pettah and Fort, the wards with the lowest death-rates were Cinnamon Gardens (8·8), Bambalapitiya (13·8), Kollupitiya (15·2), Maradana South (17·3), Kotahena (18·3), San Sebastian and Wellawatta (each 19·4).

#### (8) *Colombo Town Ward Death-rates for the Year 1926.*

WARD.	Average Crude Death-rate, 1916 to 1925.	No. of Deaths, 1926.	Crude Death-rate, 1926.	Death-rate corrected for Deaths in Colombo Hospitals, 1926.	Death-rate for Deaths in Colombo Hospitals, 1926, as com- pared with Hospitals, previous Year (corrected Year.)	Increase or Decrease in 1926, as com- pared with previous Year (corrected Death-rates.)
Colombo Town	...	31·4	7,466	28·8	23·4	-2·3
Fort	...	11·6	33	11·6	13·7	+5·2
Pettah	...	9·2	43	5·3	10·5	-4·8
San Sebastian	...	22·4	195	16·0	19·4	-2·3
St. Paul's	...	25·4	499	20·1	24·5	-4·5
Kotahena	...	23·5	436	15·0	18·3	-2·0
Mutwal	...	544	27·5	30·8	32·5	-1·7
New Bazaar	...	26·3	497	20·1	24·5	-8·7
Maradana North	...	478	20·9	26·0	24·6	+1·4
Maradana South	...	268	13·6	17·3	19·3	-2·0
Dematagoda	...	421	22·7	30·2	26·9	+3·3
Slave Island	...	498	21·8	26·6	24·5	+2·1
Kollupitiya	...	173	11·4	15·2	17·9	-2·7
Cinnamon Gardens	...	77	7·7	8·8	10·4	-1·6
Bambalapitiya	...	100	9·9	13·8	14·7	-0·9
Timbirigasyaya	...	128	19·2	25·6	27·0	-1·4
Wellawatta	...	161	14·0	19·4	21·0	-1·6
Hospitals	...	2,915	—	—	—	—

NOTE.— 1) The Colombo crude death-rate includes 1,399 deaths of non-residents in Colombo hospitals and the Ward crude death-rates exclude 1,165 deaths of town residents in hospital.

(2) The corrected death-rate for Mutwal Ward is obtained by (a) allocating to Mutwal Ward the deaths of Mutwal residents in hospital and (b) deduction of deaths of vagrants in the Home for Vagrants' and House of Detention, which institutions are in Mutwal Ward.

#### VI.—RACIAL DEATH-RATES.

The following statements show the births and deaths registered and the death-rates for each race :—

#### (9) *Racial Death-rates.*

Race.	Average Crude Death-rate, 1916 to 1925.	No. of Deaths, 1926.	Crude Death-rate, 1926.	Death-rate corrected for Deaths of Non-residents in Colombo Hospitals.	Increase or Decrease of Crude Death- rate, 1926, when com- pared with Average Crude Death-rate.	Decrease due to correction for Deaths of Non-residents in Colombo Hospitals.	Death-rate corrected for Deaths of Colombo Residents in Hospitals.	Death-rate further corrected for Age and Sex outside Colombo.	Death-rate for Age and Sex outside Colombo.
All Races	31·4	7,466	28·8	23·4	-2·6	5·4	23·7	27·7	27·7
Europeans	18·4	61	20·3	14·0	+1·9	6·3	...	...	...
Burghers	23·7	304	19·3	17·6	-4·4	1·7	...	...	...
Sinhalese	35·3	4,214	34·7	25·9	-0·6	8·8	...	...	...
Tamils	28·0	1,318	23·0	20·8	-5·0	2·2	...	...	...
Moors	30·2	1,084	25·8	25·6	-4·4	0·2	...	...	...
Malays	37·8	221	35·6	35·5	-2·2	0·1	...	...	...
Others	23·4	264	20·5	18·3	-2·9	2·2	...	...	...

## MUNICIPALITY OF COLOMBO.

WARD.	BIRTHS.		DEATHS.		Infant Deaths.	
	Total Births.	Nationality.	Total Deaths.	Nationality.	Others.	Malays.
Colombo Town	8,114	4,141	3,973	87	566	4,838
Fort	...	2	1	—	1	—
Pettah	...	24	16	8	—	—
San Sebastian	...	278	134	144	5	75
St. Paul's	...	487	251	236	4	114
Kotahena	...	584	304	280	—	42
Mutwal	...	567	296	271	—	25
New Bazaar	...	649	323	326	—	59
Maradana North	...	577	295	282	1	42
Maradana South	...	291	157	134	2	17
Dematagoda	...	476	235	241	2	45
Slave Island	...	558	301	257	1	42
Kollupitiya	...	243	123	120	9	25
Cinnamon Gardens	...	70	38	32	5	10
Bambalapitiya	...	180	81	99	7	40
Timbiringasyaya	...	266	142	123	44	10
Wellawatta	...	291	151	140	1	40
Hospital (Town)	2,571	1,292	1,279	15	159	2,110
Hospital (Untraced)						
Hospital (Beyond limits)						
					8	1,399
						822
						1,194
						27
						122
						8
						1
						22
						14
						18
						2
						1
						80
						22
						28
						362

## VII.—PRINCIPAL CAUSES OF DEATHS.

Pneumonia, as usual, heads the list of causes of deaths with a total of 926 deaths, followed by pulmonary tuberculosis with 588 deaths, and diarrhoea (including enteritis) with 575 deaths. Enteric fever shows a marked improvement with 162 deaths, as against 269 in 1925, while plague was responsible for only 8 deaths, as against 62 in the previous year. Influenza shows an increased mortality with 307 deaths, as against 269 in 1925. The malarial deaths occurred, so far as could be ascertained, entirely in persons infected outside the town. The increase in the number of deaths from rabies is noteworthy.

(10) *Principal Causes of Deaths during the Year 1926.*

Cause of Death.	No. of Deaths.
*Pulmonary Tuberculosis ...	588
Acute Miliary Tuberculosis ...	2
Tuberculous Meningitis ...	3
Abdominal Tuberculosis ...	11
Tuberculosis of the Spine ...	3
Tuberculous Glands ...	9
Tubercular Sinus ...	2
Tuberculosis of other Organs ...	7
Disseminated Tuberculosis ...	2
Pneumonia (and Broncho-Pneumonia) ...	926
Bronchitis ...	226
Diarrhoea ...	212
Enteritis ...	363
Dysentery ...	213
*Enteric Fever ...	162
Pyrexia ...	65
Malaria ...	98
Malarial Cachexia ...	15
*Plague ...	8
Debility ...	406
Influenza ...	307
Convulsions (under one year) ...	420
Convulsions (one year and over) ...	147
627 Tuberculous Diseases.	
788 Total Diarrhoeal.	
113 Total Malaria	
567 Total Convulsions.	

\* Those marked with an asterisk are notifiable infectious diseases.

(11) *Certain Minor Causes of Deaths, 1926.*

Cause of Death.	No. of Deaths,	Cause of Death.	No. of Deaths.
Anchylostomiasis ...	147	*Measles ...	4
Intestinal Parasites ...	157	*Diphtheria ...	8
Paralysis ...	139	Whooping Cough ...	6
Rickets ...	67	Rabies ...	10
Cancer ...	100	*Smallpox ...	1
Tetanus ...	91	*Cholera ...	—

\* Those marked with an asterisk are notifiable infectious diseases.

(12) *Causes of Deaths registered in Colombo during the Year 1926.*

## Nationality.

Causes of Deaths.	Colombo Town.	Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
All Causes.	7,466	61	304	4,214	1,318	1,084	221	264
I.—General Diseases:—								
1.—Epidemic Diseases ...	832	4	29	435	186	127	14	37
2.—Septic Diseases ...	59	2	5	32	12	6	—	2
3.—Tuberculous Diseases ...	626	2	22	382	106	80	17	17
4.—Venereal Diseases ...	46	—	1	29	6	5	3	2
5.—Cancer or Malignant Diseases ...	100	2	7	67	17	5	—	2
6.—Other General Diseases ...	278	2	15	144	59	35	15	8
II.—Diseases of the Nervous System and Organs of Special Sense ...	842	3	40	421	129	186	35	28
III.—Diseases of the Circulatory System ...	233	7	18	125	42	24	12	5
IV.—Diseases of the Respiratory System ...	1,211	9	47	680	209	156	34	76
V.—Diseases of the Digestive System ...	1,114	9	39	663	219	129	21	34
VI.—Non-venereal Diseases of the Genito-Urinary System and Annexa ...	271	9	13	145	42	43	8	11
VII.—The Puerperal State ...	201	1	13	135	19	28	4	1
VIII.—Diseases of the Skin and of the Cellular Tissue ...	97	—	4	67	15	7	1	3
IX.—Diseases of the Bones and of the Organs of Locomotion ...	5	—	—	3	2	—	—	—
X.—Malformations ...	8	1	1	4	1	1	—	—
XI.—Diseases of Early Infancy ...	532	—	20	307	109	70	14	12
XII.—Old Age ...	512	2	16	277	64	120	26	7
XIII.—Affections produced by External Causes:—								
1.—Suicide ...	13	1	4	3	2	1	—	2
2.—Homicide ...	18	—	—	15	—	2	1	—
3.—Judicial Hanging or Execution ...	21	—	—	20	—	—	—	1
4.—Accident and other External Violence ...	148	3	4	83	33	15	1	9
XIV.—Ill-defined Diseases ...	299	4	7	176	46	44	15	7

## (12) Causes of Deaths, &amp;c.—contd.

	Causes of Deaths.	Colombo Town.	Nationality							
			Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.		
<b>I.—GENERAL DISEASES.</b>										
<i>Epidemic Diseases.</i>										
1.—Enteric Fever	...	162	...	2	...	13	...	1		
2.—Typhus Fever	...	—	—	—	—	—	—	10		
3.—Relapsing Fever	...	—	—	—	—	—	—	—		
4.—{(a) Malaria	...	98	...	—	—	—	—	—		
{(b) Malarial Cachexia	...	15	...	5	...	27	...	2		
5.—Smallpox {(a) Vaccinated	...	—	—	50	...	—	—	—		
{(b) Not Vaccinated	...	—	—	5	...	3	...	1		
{(c) Doubtful	...	1	...	—	—	—	—	2		
6.—Measles	...	4	...	—	—	—	—	—		
7.—Scarlet Fever	...	—	—	—	—	—	—	—		
8.—Whooping Cough	...	6	...	1	...	—	—	1		
{(a) Diphtheria	...	8	...	—	7	...	—	—		
9.—{(b) Membranous Laryngitis	...	—	—	—	—	—	—	—		
{(c) Croup	...	—	—	—	—	—	—	—		
10.—Influenza	...	307	...	1	8	109	87	82		
11.—Miliary Fever	...	—	—	—	—	—	—	7		
12.—Asiatic Cholera	...	—	—	—	—	—	—	13		
13.—Cholera Nostras	...	—	—	—	—	—	—	—		
{(a) Amœbic Dysentery	...	16	...	1	10	2	2	1		
{(b) Bacillary Dysentery	...	15	...	1	11	1	—	2		
{(c) Dysentery (type not distinguished)	...	182	...	2	104	49	21	5		
15.—Plague	...	8	...	—	3	2	2	1		
16.—Yellow Fever	...	—	—	—	—	—	—	—		
17.—Leprosy	...	1	...	—	1	—	—	—		
18.—Erysipelas	...	9	...	2	5	1	—	1		
{(a) Mumps	...	—	—	—	—	—	—	—		
{(b) Varicella (Chickenpox)	...	—	—	—	—	—	—	—		
{(c) Other Epidemic Diseases	...	—	—	—	—	—	—	—		
20.—{(a) Pyæmia	...	6	...	2	4	—	1	1		
{(b) Septicaemia	...	53	...	5	28	12	5	1		
{(c) Vaccinia	...	—	—	—	—	—	—	—		
21.—Glanders	...	—	—	—	—	—	—	—		
22.—Anthrax	...	—	—	—	—	—	—	—		
23.—Rabies, Hydrophobia	...	10	...	1	9	—	—	—		
24.—Tetanus	...	91	...	4	40	32	11	2		
25.—Mycoses	...	—	—	—	—	—	—	—		
26.—Pellagra	...	—	—	—	—	—	—	—		
27.—Beri-Beri	...	—	—	—	—	—	—	—		
28.—{(a) Acute Pulmonary Tuberculosis	...	7	...	—	5	2	—	—		
{(b) Chronic Pulmonary Tuberculosis	...	580	...	18	353	96	79	17		
29.—Acute Miliary Tuberculosis	...	2	...	—	1	1	—	15		
30.—Tuberculous Meningitis	...	3	...	2	1	—	—	—		
31.—Abdominal Tuberculosis	...	11	...	1	7	2	—	1		
32.—Tuberculosis of the Spine	...	3	...	—	1	2	—	—		
33.—Tuberculosis of Joints	...	—	—	—	—	—	—	—		
34.—Tuberculosis of other Organs (Lymphatism excepted)	...	18	...	—	15	1	1	1		
35.—Disseminated Tuberculosis	...	2	...	—	—	2	—	—		
36.—Rickets	...	67	...	2	29	10	10	12		
37.—Syphilis	...	46	...	1	29	6	5	3		
37a.—Parangi (Framboesia Tropicum, Yaws)	...	—	—	—	—	—	—	—		
38.—Gonococcus Infection	...	—	—	—	—	—	—	—		
39.—Cancer and other malignant Tumours of the Buccal Cavity	...	32	...	2	23	4	2	1		
40.—Cancer and other malignant Tumours of the Stomach, Liver	...	20	...	3	10	4	2	—		
41.—Cancer and other malignant Tumours of the Peritoneum, Intestines, Rectum	...	4	...	—	2	—	1	—		
42.—Cancer and other malignant Tumours of the Female Genital Organs	...	13	...	—	10	3	—	—		
43.—Cancer and other malignant Tumours of the Breast	...	6	...	—	5	1	—	—		
44.—Cancer and other malignant Tumours of the Skin	...	1	...	—	1	—	—	—		
45.—Cancer and other malignant Tumours of other Organs or of Organs not specified	...	24	...	2	16	5	—	1		
46.—Other Tumours (Tumours of the Female Genital Organs excepted)	...	16	...	—	12	2	1	—		
47.—Acute Rheumatic Fever	...	—	—	—	—	—	—	—		
{(a) Rheumatoid Arthritis	...	—	—	—	—	—	—	—		
48.—{(b) Osteo-Arthritis	...	8	...	—	5	1	2	—		
{(c) Chronic Rheumatism	...	—	—	—	—	—	—	—		
{(d) Gout	...	—	—	—	—	—	—	—		
49.—Scurvy	...	—	—	—	—	—	—	—		
50.—Diabetes (Mellitus)	...	60	...	4	37	12	5	1		
51.—Exophthalmic Goitre	...	—	—	—	—	—	—	—		
52.—Addison's Disease	...	—	—	—	—	—	—	—		
53.—{(a) Leucocythaemia	...	1	...	—	1	—	—	—		
{(b) Lymphadenoma	...	—	—	—	—	—	—	—		
54.—{(a) Anæmia	...	25	...	4	11	2	6	—		
{(b) Chlorosis	...	—	—	—	—	—	—	—		
{(a) Diabetes Insipidus	...	—	—	—	—	—	—	—		
55.—{(b) Purpura	...	—	—	—	—	—	—	—		
{(c) Haemophilia	...	—	—	—	—	—	—	—		
{(d) Other General Diseases	...	—	—	—	—	—	—	—		

(12) *Causes of Deaths, &c.—contd.*

Causes of Deaths.	Colombo Town.	Nationality.					
		Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.
56.—Alcoholism (acute or chronic)	...	—	—	—	—	—	—
57.—Chronic Lead Poisoning	...	—	—	—	—	—	—
58.—Other Chronic Poisonings (occupational)	...	—	—	—	—	—	—
59.—Other Chronic Poisonings (non-occupational)	...	—	—	—	—	—	—
<b>II.—DISEASES OF THE NERVOUS SYSTEM AND OF ORGANS OF SPECIAL SENSE.</b>							
60.—Encephalitis	...	5	—	—	2	1	—
(a) Simple Meningitis	...	29	—	2	23	1	1
61.—(b) Cerebro-Spinal Fever	...	1	—	—	—	—	—
(c) Septic Meningitis from various causes	...	1	—	—	1	—	—
62.—Locomotor Ataxia	...	—	—	—	—	—	—
63.—Other Diseases of the Spinal Cord	...	8	—	—	6	—	—
64.—Cerebral Haemorrhage, Apoplexy	...	75	2	9	37	7	13
65.—Softening of the Brain	...	—	—	—	—	—	—
66.—Paralysis without specified cause	...	139	—	6	71	22	32
67.—General Paralysis of the Insane	...	—	—	—	—	—	—
68.—Other forms of mental alienation	...	—	—	—	—	—	—
69.—Epilepsy	...	1	—	—	1	—	—
70.—Convulsions (non-puerperal)	...	8	1	—	5	—	1
71.—Convulsions of Infants	...	147	—	7	78	24	27
72.—Chorea	...	420	—	14	195	73	109
73.—Neuralgia and Neuritis	...	—	—	—	—	—	—
74.—Other Diseases of the Nervous System	...	—	—	—	—	—	—
75.—Diseases of the Eyes and their Annexa	...	2	—	—	1	—	—
76.—(a) Mastoid Disease	...	1	—	1	—	—	—
(b) Other Diseases of the Ears	...	3	—	—	1	1	—
<b>III.—DISEASES OF THE CIRCULATORY SYSTEM.</b>							
77.—Pericarditis	...	7	1	—	5	—	1
78.—(a) Simple Acute Endocarditis	...	3	—	1	2	—	—
(b) Infective Endocarditis	...	1	—	—	1	—	—
79.—(a) Myocarditis	...	16	1	1	9	2	2
(b) Valvular Disease	...	37	2	5	14	8	3
(c) Other Organic Diseases of the Heart	...	87	1	3	44	19	12
80.—Angina Pectoris	...	7	1	—	2	2	—
(a) Aneurism	...	5	1	—	3	1	—
81.—(b) Atheroma, Arteriosclerosis	...	6	—	2	2	1	—
(c) Other Diseases of the Arteries	...	—	—	—	—	—	—
82.—(a) Cerebral Embolism and Thrombosis	...	10	—	—	7	2	—
(b) Embolism and Thrombosis other than Cerebral	...	23	—	1	20	1	1
(a) Phlebitis	...	4	—	1	2	—	—
(b) Varicose Veins	...	—	—	—	—	—	—
(c) Haemorrhoids	...	3	—	1	1	—	—
(d) Other Diseases of the Veins	...	—	—	—	—	—	—
83.—(a) Lymphatism, Status Lymphaticus	...	2	—	—	2	—	—
(b) Elephantiasis Arabum (Filariasis)	...	2	—	1	1	—	—
(c) Other Diseases of the Lymphatic System	...	3	—	—	2	—	—
84.—(a) Haemorrhage from any part	...	11	—	1	6	3	1
(b) Other Diseases of the Circulatory System	...	6	—	1	2	3	—
<b>IV.—DISEASES OF THE RESPIRATORY SYSTEM.</b>							
86.—Diseases of the Nose	...	1	—	—	—	—	1
(a) Laryngismus Stridulus	...	—	—	—	—	—	—
87.—(b) All forms of Laryngitis (Diphtheritic excepted)	...	1	1	—	—	—	—
(c) Other Diseases of the Larynx	...	1	—	—	1	—	—
88.—Diseases of the Thyroid Body	...	3	—	—	3	—	—
89.—Acute Bronchitis	...	126	2	10	66	15	18
90.—(a) Chronic Bronchitis	...	100	—	3	56	24	15
(b) Bronchiectasis	...	3	—	—	3	—	—
91.—Broncho-Pneumonia	...	418	—	11	260	64	62
92.—Pneumonia	...	508	6	21	263	96	55
93.—(a) Empyema	...	5	—	—	3	1	—
(b) Other Pleurisy	...	9	—	—	5	1	2
94.—Pulmonary Congestion, Pulmonary Apoplexy	...	1	—	—	—	1	—
95.—Gangrene of the Lungs	...	5	—	—	5	—	—
96.—Asthma	...	17	—	2	8	4	2
97.—Pulmonary Emphysema	...	—	—	—	—	—	—
98.—Other Diseases of the Respiratory System (Tuberculosis excepted)	...	13	—	—	7	4	1
<b>V.—DISEASES OF THE DIGESTIVE SYSTEM.</b>							
(a) Diseases of the Teeth and Gums (Oral Sepsis)	...	—	—	—	—	—	—
99.—(b) Thrush, Stomatitis	...	11	—	—	7	2	1
(c) Parotitis (Septic)	...	—	—	—	—	—	—
(d) Other Diseases of the Mouth and Annexa	...	—	—	—	—	—	—
100.—(a) Tonsillitis (other than Diphtheritic)	...	2	—	—	2	—	—
(b) Quinsy	...	—	—	—	—	—	—
(c) Other Diseases of the Pharynx	...	2	—	—	1	1	—
101.—Diseases of the Esophagus	...	—	—	—	—	—	—
102.—Gastric Ulcer	...	3	—	—	2	1	—

## (12) Causes of Deaths, &amp;c.—contd.

	Causes of Deaths.	Colombo Town.	Nationality.						
			Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
103.	{(a) Gastritis, Gastric Catarrh ... (b) Other Diseases of the Stomach (Cancer excepted) ...	16 ...	1	1	7 ...	1 ...	4 ...	1 ...	3
104.	{(a) Epidemic Diarrhoea ... (b) Diarrhoea Infantile, Diarrhoea due to food ... (c) Diarrhoea undefined ... & (d) Enteritis ...	2 ... 37 ... 173 ... 310 ...	1	2	24 ... 95 ... 194 ... 47 ...	5 ... 50 ... 41 ... 8 ...	5 ... 14 ... 21 ... 1 ...	1 ... 2 ... 8 ... 2 ...	1 ... 1 ... 10 ... 1 ...
105.	{(e) Gastro-enteritis ... (f) Colic ... (g) Intestinal Ulceration, Colitis ... (h) Duodenal Ulcer ...	53 ...	1	2	29 ...	10 ...	8 ...	2 ...	1 ...
106.	—Anchylostomiasis ...	147 ...	1	1	96 ...	36 ...	9 ...	1 ...	4 ...
107.	—Intestinal Parasites ...	157 ...	1	2	99 ...	25 ...	25 ...	3 ...	3 ...
108.	—Appendicitis and Typhlitis ...	13 ...	1	—	5 ...	2 ...	2 ...	1 ...	2 ...
109.	{(a) Hernia ... (b) Intestinal Obstruction ...	12 ... 12 ...	—	1	4 ... 7 ...	2 ... 1 ...	6 ... 2 ...	—	1 ...
110.	{(a) Psilosis (Sprue or Ceylon Sore-mouth) ... (b) Other Diseases of the Intestine ...	8 ... 13 ...	3 ... 1 ...	2	— ... 4 ...	8 ...	— ... 1 ...	— ... 1 ...	— ... 1 ...
111.	—Acute Yellow Atrophy of the Liver ...	2 ...	—	1	1 ...	—	—	—	—
112.	—Hydatid Tumour of the Liver ...	1 ...	—	—	—	1 ...	—	—	—
113.	{(a) Cirrhosis of the Liver (Alcoholic) ... (b) Cirrhosis of the Liver (Toxic) ...	2 ... 33 ...	—	1	1 ... 23 ...	5 ...	— ... 1 ...	1 ... 1 ...	— ... 1 ...
114.	Gallstones ...	— ...	—	—	—	—	—	—	—
115.	—Other Diseases of the Liver ...	36 ...	—	2	22 ...	9 ...	1 ...	1 ...	1 ...
116.	—Diseases of the Spleen ...	— ...	—	—	—	—	—	—	—
117.	—Peritonitis (cause unknown) ...	39 ...	—	1	22 ...	7 ...	5 ...	—	4 ...
118.	—Other Diseases of the Digestive System (Cancer and Tuberculosis excepted) ...	13 ...	1 ...	3	5 ...	3 ...	1 ...	—	—
<b>VI.—NON-VENEREAL DISEASES OF THE GENITO-URINARY SYSTEM AND ANNEXA.</b>									
119.	—Acute Nephritis ...	158 ...	4 ...	6 ...	79 ...	22 ...	32 ...	7 ...	8 ...
120.	—Bright's Disease ...	25 ...	1 ...	2	10 ...	6 ...	4 ...	1 ...	1 ...
121.	—Chyluria ...	— ...	—	—	—	—	—	—	—
122.	—Other Diseases of the Kidneys and Annexa ...	44 ...	4 ...	3	24 ...	7 ...	5 ...	—	1 ...
123.	—Urinary Calculi ...	— ...	—	—	—	—	—	—	—
124.	—Diseases of the Bladder ...	13 ...	—	1	9 ...	1 ...	1 ...	—	1 ...
125.	—Diseases of the Urethra, Urinary Abscess, &c.	8 ...	—	—	5 ...	3 ...	—	—	—
126.	—Diseases of the Prostate ...	4 ...	—	—	4 ...	—	—	—	—
127.	—Diseases of the Male Genital Organs (non-venereal) ...	7 ...	—	1	3 ...	2 ...	1 ...	—	—
128.	—Uterine Hæmorrhage (non-puerperal) ...	1 ...	—	—	1 ...	—	—	—	—
129.	—Uterine Tumour (non-cancerous) ...	— ...	—	—	—	—	—	—	—
130.	—Other Diseases of the Uterus ...	3 ...	—	—	3 ...	—	—	—	—
131.	—Cysts and other Tumours of the Ovary ...	4 ...	—	—	4 ...	—	—	—	—
132.	—Salpingitis and other Diseases of the Female Genital Organs ...	4 ...	—	—	3 ...	1 ...	—	—	—
133.	—Non-puerperal Diseases of the Breast (Cancer excepted) ...	— ...	—	—	—	—	—	—	—
<b>VII.—THE PUERPERAL STATE.</b>									
134.	{(a) Abortion, Miscarriage ... (b) Ante-partum Hæmorrhage ... (c) Ectopic Gestation ... (d) Other Accidents of Pregnancy ...	3 ... — ... 1 ... 11 ...	—	—	1 ... — ... 1 ... 9 ...	1 ... — ... 1 ... 1 ...	1 ... — ... 1 ... 1 ...	1 ... — ... 1 ... 1 ...	— ... — ... — ... 1 ...
135.	—Puerperal Hæmorrhage ...	15 ...	—	5	8 ...	—	—	1 ...	1 ...
136.	—Other Accidents of Childbirth ...	3 ...	—	—	3 ...	—	—	—	—
137.	—Puerperal Septicaemia ...	98 ...	1	—	70 ...	11 ...	13 ...	3 ...	—
138.	{(a) Puerperal Albuminuria, Nephritis, &c. (b) Puerperal Eclampsia ...	— ... 6 ...	—	1	3 ...	1 ...	1 ...	—	—
139.	{(a) Puerperal Phlegmasia, Alba Dolens (b) Puerperal Embolism, Sudden Death, &c.	— ... 2 ...	—	1	— ... 1 ...	— ... 1 ...	— ... 1 ...	—	—
140.	{(a) Puerperal Insanity ... (b) Consequences of Childbirth (not otherwise defined) ...	3 ... 59 ...	—	1	2 ... 38 ...	—	—	—	—
141.	—Puerperal Diseases of the Breast ...	— ...	—	4	6 ...	10 ...	1 ...	—	—
<b>VIII.—DISEASES OF THE SKIN AND OF THE CELLULAR TISSUE.</b>									
142.	—Gangrene ...	36 ...	—	—	26 ...	6 ...	3 ...	1 ...	—
143.	{(a) Carbuncle ... (b) Furuncle (Boil) ...	7 ... — ...	—	—	5 ... —	1 ... —	—	—	1 ...
144.	{(a) Phlegmon ... (b) Acute Abscess, Abscess unqualified ... (a) Ulcer, Bedsore ...	— ... 11 ... 15 ...	—	1	6 ... 1 ... 12 ...	1 ... 1 ... 2 ...	3 ... —	—	—
145.	{(b) Eczema ... (c) Pemphigus ... (d) Other Diseases of the Integumentary System (Elephantiasis Arabum excepted.)	— ... 2 ... 26 ...	—	—	1 ... 1 ... 17 ...	1 ... 1 ... 4 ...	1 ... —	—	2 ...
<b>IX.—DISEASES OF THE BONES AND OF THE ORGANS OF LOCOMOTION.</b>									
146.	—Diseases of the Bones (Tuberculosis and Mastoid Disease excepted) ...	2 ...	—	—	2 ...	—	—	—	—
147.	—Diseases of the Joints (Tuberculosis and Rheumatism excepted) ...	3 ...	—	—	1 ...	2 ...	—	—	—
148.	—Amputations ...	— ...	—	—	—	—	—	—	—
149.	—Other Diseases of the Organs of Locomotion	— ...	—	—	—	—	—	—	—

## (12) Causes of Deaths, &amp;c.—contd.

	Causes of Deaths.	Colombo Town.	Nationality.						
			Europeans.	Burghers.	Sinhalese.	Tamis.	Moors.	Malays.	Others.
<b>X.—MALFORMATIONS.</b>									
150.	{ (a) Congenital Hydrocephalus ... (b) Congenital Diseases of the Heart ... (c) Other Congenital Malformations (Stillbirths excluded) ...	1 ... — ... 7 ...	— ... — ... 1 ...	— ... — ... 1 ...	1 ... — ... 3 ...	— ... — ... 1 ...	— ... — ... 1 ...	— ... — ... — ...	— ... — ... — ...
<b>XI.—DISEASES OF EARLY INFANCY.</b>									
151.	{ (a) Premature Birth ... (b) Debility ... (c) Want of Breast Milk ... (d) Atrophy, Icterus, Sclerema Neonatorum ...	154 ... 341 ... 21 ... 3 ...	— ... — ... — ... — ...	7 ... 11 ... 16 ... 1 ...	106 ... 176 ... 3 ... 2 ...	24 ... 79 ... 3 ... — ...	8 ... 60 ... 1 ... — ...	5 ... 8 ... 1 ... — ...	4 ... 7 ... — ... — ...
152.	{ (a) Atelectasis ... (b) Injuries at Birth ... (c) Other Diseases peculiar to early Infancy	2 ... 1 ... 9 ...	— ... — ... — ...	— ... — ... 1 ...	— ... — ... 4 ...	— ... — ... 2 ...	— ... — ... 1 ...	— ... — ... — ...	— ... — ... 1 ...
153.	Lack of care ...	1 ...	— ...	— ...	1 ...	— ...	— ...	— ...	— ...
<b>XII.—OLD AGE.</b>									
154.	Senility ...	512 ...	2 ...	16 ...	277 ...	64 ...	120 ...	26 ...	7
<b>XIII.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.</b>									
155.	Suicide by Poison ...	5 ...	— ...	4 ...	— ...	1 ...	— ...	— ...	— ...
156.	Suicide by Asphyxia ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
157.	Suicide by Hanging or Strangulation ...	3 ...	— ...	— ...	2 ...	1 ...	— ...	— ...	— ...
158.	Suicide by Drowning ...	2 ...	— ...	— ...	1 ...	— ...	— ...	— ...	— ...
159.	Suicide by Firearms ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
160.	Suicide by Cutting or Piercing Instrument ...	3 ...	1 ...	— ...	— ...	— ...	— ...	1 ...	— ...
161.	Suicide by Jumping from high places ...	1 ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
162.	Suicide by Crushing ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
163.	Suicide by other means ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
164.	Poisoning by Food ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
	{ (a) Snake-bite ... (b) Insect Stings (Venomous) ... (c) Other Acute Poisonings ...	1 ... — ... 6 ...	— ... — ... — ...	— ... 1 ... 1 ...	1 ... — ... 3 ...	— ... — ... 2 ...	— ... — ... — ...	— ... — ... — ...	— ... — ... — ...
165.	Conflagration ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
166.	Burns (Conflagration excepted) ...	15 ...	— ...	— ...	10 ...	2 ...	1 ...	— ...	2
167.	Absorption of Deleterious Gases (Conflagration excepted) ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
168.	Accidental Drowning ...	23 ...	1 ...	— ...	12 ...	5 ...	3 ...	1 ...	1
169.	Traumatism by Firearms ...	1 ...	1 ...	— ...	— ...	— ...	— ...	— ...	— ...
170.	Traumatism by Cutting or Piercing Instruments ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
171.	{ (a) Traumatism by Fall from trees ... (b) Traumatism by Fall from heights other than trees ... (c) Traumatism by other Accidental Fall ...	7 ... 2 ... 6 ...	— ... — ... 1 ...	— ... — ... — ...	6 ... — ... 4 ...	— ... — ... — ...	— ... 1 ... 1 ...	— ... — ... — ...	— ... — ... — ...
172.	Traumatism in Mines and Quarries ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
173.	Traumatism by Machines ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
174.	Traumatism by Other Crushing (Vehicles, Railroad, Landslides, &c.) ...	67 ...	— ...	3 ...	35 ...	20 ...	7 ...	— ...	2
175.	Injuries by Animals ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
176.	Starvation ...	— ...	1 ...	— ...	— ...	1 ...	— ...	— ...	— ...
177.	Excessive Cold ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
178.	Effects of Heat ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
179.	Lightning ...	— ...	2 ...	— ...	— ...	— ...	2 ...	— ...	— ...
180.	Electricity (Lightning excepted) ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...
181.	Homicide by Firearms ...	2 ...	— ...	— ...	2 ...	— ...	— ...	— ...	— ...
182.	Homicide by Cutting or Piercing Instruments ...	— ...	11 ...	— ...	— ...	8 ...	— ...	2 ...	1 ...
183.	Homicide by other means ...	— ...	5 ...	— ...	— ...	5 ...	— ...	— ...	— ...
184.	Fractures (cause not specified) ...	10 ...	— ...	— ...	— ...	9 ...	— ...	— ...	1
185.	Judicial Hanging or Execution ...	21 ...	— ...	— ...	20 ...	— ...	— ...	— ...	1
186.	{ (a) Other External Violence ... (b) Diseases not specified ...	6 ... — ...	— ... — ...	— ... — ...	1 ... — ...	3 ... <td>— ...<td>— ...<td>2</td></td></td>	— ... <td>— ...<td>2</td></td>	— ... <td>2</td>	2
<b>XIV.—ILL-DEFINED DISEASES.</b>									
187.	{ (a) Dropsy ... (b) Ascites ... (c) Other Ill-defined Organic Disease ...	— ... 2 ... 1 ...	— ... — ... — ...	— ... — ... — ...	— ... 1 ... — ...	— ... 1 ... — ...	— ... — ... — ...	— ... — ... — ...	— ... — ... 1
188.	{ (a) Syncope ... (b) Sudden Death (not otherwise defined) ... (c) Heart Failure ...	— ... — ... 34 ...	— ... — ... 1 ...	— ... — ... 1 ...	— ... — ... 19 ...	— ... — ... 9 ...	— ... — ... 3 ...	— ... — ... 1 ...	— ... — ... 1
189.	{ (b) Atrophy, Debility, &c., one year and over ... (c) Teething ... (d) Pyrexia ...	65 ... — ... 65 ...	1 ... — ... 1 ...	2 ... — ... 34 ...	— ... — ... 16 ...	— ... — ... 7 ...	— ... — ... 1 ...	— ... — ... 1 ...	— ... — ... 4
	{ (e) Marasmus and Asthenia ... (f) Other Ill-defined Causes ... (g) Diseases not specified ...	124 ... 8 ... — ...	1 ... 1 ... — ...	1 ... 80 ... — ...	13 ... — ... — ...	20 ... — ... — ...	8 ... 1 ... — ...	— ... — ... — ...	— ... — ... 1

## VIII.—INFANT MORTALITY.

8,114 births and 1,658 deaths of children under one year of age were recorded during 1926, the infant death-rate being thus 204 per 1,000 births. This is the lowest infant death-rate recorded in Colombo, the previous lowest being 220 per 1,000 births in the previous year.

As Statement 12 and Diagram II. (d) show, the infant mortality in Colombo has been steadily falling for a long series of years, until in the year under review it was rather less than half what it was in 1903, viz., 410 per 1,000 births. An examination of the detailed statistics shows that the improvement in 1926 compared with the previous year was to a large extent the result of a marked reduction in the mortality ascribed to atrophy and debility, but convulsions, diarrhoea, and pneumonia likewise showed improvement; premature births on the other hand showed an increase compared with the previous year.

The reduction in the infant mortality during the last 24 years reflects credit upon the officers of the Child Welfare Branch of the Department, and the setting up of a new record during each of the last two years is a testimony to the good work done by Dr. (Mrs.) Rowlands, who has been in charge of this branch since May, 1925. It is unfortunate that considerations of health have necessitated her resigning almost at the commencement of her career in this branch of work.

(13) *Births and Infantile Deaths with their Rates for Colombo Town, 1903 to 1926.*

Year.	No. of Births.	Birth-rate.	No. of Infant Deaths.	Infant Mortality.
1903	3,552	21·5	1,457	410
1904	3,670	21·6	1,296	353
1905	3,916	22·5	1,414	361
1906	4,726	26·5	1,428	300
1907	4,280	23·4	1,300	304
1908	4,602	24·5	1,635	355
1909	4,589	23·8	1,423	310
1910	4,819	23·1	1,420	295
1911	5,280	24·8	1,669	316
1912	5,193	23·3	1,554	299
1913	5,693	25·3	1,627	286
1914	5,359	23·6	1,392	260
1915	5,641	24·5	1,525	270
1916	5,552	23·9	1,297	234
1917	5,860	25·0	1,470	251
1918	5,920	24·9	1,572	266
1919	5,907	24·6	1,603	271
1920	7,197	29·7	1,679	233
1921	8,724	35·7	2,098	240
1922	6,881	27·8	1,702	247
1923	7,107	28·4	1,929	271
1924	6,887	27·2	1,643	239
1925	7,663	29·9	1,689	220
1926	8,114	31·3	1,658	204

(14) *Principal Causes of Infant Mortality in 1926.*

Expressed as a percentage of Total Infant Deaths.

Cause of Death.	No. of Deaths.	Percentage of Total Infant Deaths.
Convulsions	420	25·3
Atrophy and Debility	352	21·2
Diarrhoeal Diseases	192	11·6
Pneumonia	182	11·0
Premature Birth	154	9·3

(15) *Infant Deaths during each Quarter, 1926.*

		1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
Developmental	Atrophy and Debility	90	59	88	115
	Premature Birth	30	33	35	56
Respiratory	Bronchitis	9	16	12	9
	Pneumonia	51	45	53	33
	Diarrhoeal	56	44	68	24
	Convulsions	118	89	97	116
	Total	354	286	353	353

(16) *Infant Mortality by Race, 1926. Number of Infant Deaths and Rate per 1,000 Births.*

		No. of Infant Deaths, 1926.	Rate per 1,000 Births. 1926.	Rate per 1,000 Births previous Year.	Increase or Decrease of 1926 when compared with Previous Year.
					1926.
All Races	...	1,658	204	220	- 16
Europeans	...	4	46	30	+ 16
Burghers	...	70	124	132	- 8
Sinhalese	...	913	189	201	- 12
Tamils	...	282	266	309	- 43
Moors	...	283	251	302	- 51
Malays	...	68	239	130	+ 109
Others	...	38	252	186	+ 66

(17) *Infant Mortality, 1926, by Wards. Rate per 1,000 Births.*

## Infant Mortality Rates.

Ward.	Average, 1916 to 1925.	1925.	1926.	Increase or Decrease of 1926 rate when compared with 1925
Colombo Town...	246	220	204	- 16
Fort	220	—	—	—
Pettah	338	316	167	- 149
San Sebastian	331	272	259	- 13
St. Paul's	404	353	267	- 86
Kotahena	263	305	224	- 81
Mutwal	252	257	...	+ 5
New Bazaar	356	313	245	- 68
Maradana North	274	250	...	- 24
Maradana South	284	225	247	+ 22
Dematagoda	231	254	...	+ 23
Slave Island	276	217	262	+ 45
Kollupitiya	244	198	...	- 46
Cinnamon Gardens	197	229	...	+ 32
Bambalapitiya	176	122	...	- 54
Timbirigasyaya	209	154	...	- 55
Wellawatta	209	141	...	- 68
Hospitals	145	132	141	+ 9

(18) *Infant Mortality, by Race, during the Year 1926. Rate per 1,000 Births.*

	All Races.	Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
All Causes	204	46	124	189	266	251	239	252
Premature Birth	19.0	—	12.4	21.9	22.6	7.1	17.5	26.5
Atrophy and Debility	43	—	21.2	37.8	76.4	53.2	28.1	53.0
Bronchitis	5.7	—	7.1	3.9	4.7	8.0	28.1	6.6
Pneumonia	22.4	—	15.9	24.2	13.2	24.0	24.6	53.0
Diarrhoeal Diseases	23.7	23	15.9	25.8	21.7	22.2	14.0	26.5
Convulsions	52	—	24.7	40.3	69	96.7	77.2	46.4
Tetanus	2.2	—	3.5	1.0	6.6	1.8	7.0	—
All Other causes	36	23	23	33.9	51	38.2	42.1	39.7

(19) (a) *Causes of Infant Mortality, 1908 to 1926—Number of Deaths.*

CAUSE OF INFANT DEATH.	1908	1909	1910	1911	1912	Average, 1908-1912	1913	1914	1915	1916	1917	Average, 1913-1917	1918	1919	1920	1921	1922	Average, 1918-1922	1923	1924	1925	1926
Developmental Diseases	410	320	324	379	378	362	402	361	434	446	573	443	570	598	498	706	603	595	685	617	602	609
Pneumonia and Bronchitis	247	250	221	267	269	251	302	198	189	157	180	205	301	220	228	311	251	262	263	213	241	228
Digestive Diseases	254	148	230	231	196	222	264	207	227	169	215	216	190	201	220	279	225	223	262	235	220	226
Convulsions	502	382	396	483	472	447	472	451	482	388	404	439	365	418	590	602	411	477	480	409	426	420
Tetanus Neonatorum	133	173	150	141	77	135	51	27	29	16	25	30	29	17	17	16	17	19	7	22	13	18
Tuberculosis	18	18	20	3	3	12	—	1	2	3	3	2	5	5	6	19	9	9	10	4	2	—
Infectious Diseases	8	4	1	4	5	4	—	7	12	3	4	5	2	3	6	7	2	4	6	1	3	3
Syphilis	7	14	13	22	20	15	23	28	17	19	16	21	28	37	33	33	44	35	59	36	37	34

## MUNICIPALITY OF COLOMBO.

(20) (b) *Causes of Infant Mortality, 1908 to 1926—Rates per 1,000 Births.*

CAUSE OF INFANT DEATH.	1908	1909	1910	1911	1912	Average 1908-1912	1913	1914	1915	1916	1917	Average 1913-1917	1918	1919	1920	Average 1918-1922	1923	1924	1925	1926		
	1908	1909	1910	1911	1912	Average 1908-1912	1913	1914	1915	1916	1917	Average 1913-1917	1918	1919	1920	Average 1918-1922	1923	1924	1925	1926		
Developmental Diseases	89	70	67	72	73	74	71	67	77	80	98	78	96	100	69	81	88	86	96	90	78	75
Pneumonia and Bronchitis	54	55	46	51	52	51	53	37	33	28	31	36	51	37	32	36	36	38	37	31	31	28
Digestive Diseases	55	43	48	44	38	45	46	39	40	30	37	38	32	34	31	32	33	32	37	34	29	28
Convulsions	109	83	82	91	91	91	83	84	85	70	69	78	62	71	82	69	60	69	68	59	56	52
Tetanus Neonatorum	29	38	31	27	18	28	9	5	5	3	4	5	5	3	2	2	2	3	1	3	2	2.2
Tuberculosis	4	4	4	1	1	3	—	0.2	0.4	0.5	0.5	0.3	1	1	2	1	1	1	0.6	0.3	—	
Infectious Diseases	2	1	0.2	1	1	1	—	1	2	0.5	0.7	1	0.3	0.5	1	1	0.6	0.6	1	0.1	0.4	0.37
Syphilis	2	3	3	4	4	3	4	5	3	3	3	4	5	6	5	4	6	5	8	5	5	4.2

(21) *Infant Mortality, 1926. Deaths at different Age Periods and from Several Causes.*

Cause of Death.	Age.												Race.															
	Age in Weeks.					Age in Months.							Europeans.		Burghers.		Sinhalese.		Tamil.		Moors.		Malays.		Others.		All Races	
	1	2	3	4	Total.	2	3	4	5	6	7-9	10-12	Total.	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
I.—Developmental Diseases:—																												
1. Premature birth	135	7	3	3	148	—	1	—	1	—	2	—	1	—	6	—	7	106	24	8	5	4	154	—	—	—		
2. Atalectasis	2	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	2	—	—	—		
3. Atrophy and Debility	163	36	19	12	230	35	14	20	11	11	22	—	9	122	—	12	183	81	60	8	8	352	—	—	—			
4. Others	7	3	5	1	16	12	10	16	7	5	19	16	85	1	3	60	14	14	7	2	101	—	—	—				
II.—Diseases of Respiratory System:—																												
1. Laryngitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
2. Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
3. Bronchitis	—	—	2	2	1	5	2	3	7	7	5	10	7	41	—	4	19	5	9	8	1	46	—	—	—			
4. Pneumonia	2	2	1	4	9	14	11	16	17	13	49	53	173	—	9	117	14	27	7	8	182	—	—	—	—			
5. Others	2	3	—	1	6	2	5	4	1	5	18	15	50	—	1	24	18	9	1	3	56	—	—	—	—			
III.—Diseases of Digestive System:—																												
1. Diarrhoeal	—	1	3	7	3	13	17	33	20	19	16	37	37	179	2	9	125	23	25	4	4	192	—	—	—	—		
2. Dentition	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
3. Others	2	—	4	—	6	8	1	1	2	1	10	5	28	—	—	16	10	6	2	—	34	—	—	—	—	—		
IV.—Diseases of Nervous System:—																												
1. Convulsions	58	43	17	18	136	43	39	45	28	30	42	57	284	—	14	195	73	109	22	7	420	—	—	—	—	—		
2. Laryngismus stridulus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
3. Tetanus	6	12	—	—	18	—	—	—	—	—	—	—	—	—	—	2	5	7	2	2	18	—	—	—	—	—		
4. Others	2	—	—	—	2	—	—	—	—	—	—	1	1	2	—	1	3	—	—	—	4	—	—	—	—	—		
V.—Tuberculous Diseases:—																												
1. Tabes mesenterica	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
2. Tubercular meningitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
3. Others	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
VI.—Accidents:—																												
1. Injury	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1		
2. Umbilical haemorrhage	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1		
3. Suffocation	2	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	2</		

(22) *Infectious Diseases Recorded. (Town Cases.) 1903—1926.*

Diseases.	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	
Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	291	207	70	87	235	184	136	230	148	64	13
Cholera	... 1	—	—	—	—	—	—	—	—	—	—	—	—	—	413	138	29	4	—	—	—	—	—	—	—
Smallpox	... 7	1	45	40	49	438	78	69	30	1	19	—	—	—	80	3	1	36	1	12	34	3	4	1	10
Chickenpox	... 230	274	398	231	259	543	828	901	934	427	491	560	627	3,204	1,295	788	495	3	75	—	—	—	—	—	1,045
Measles	... 119	278	397	354	74	666	436	149	330	643	524	52	20	1,353	1,127	88	399	1,062	711	699	1,235	790	1,703	1,045	
Diphtheria	... 262	303	451	709	741	1,131	683	786	1,063	566	415	229	393	437	357	512	7	13	7	20	190	226	650	627	
Enteric fever*	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Continued fever* and "suspected enteric"	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Phthisis*	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	... —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
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	... —	—	—	—	—	—																			

## X.—PLAQUE.

*Human Plague.*—Thirteen cases, with 12 deaths, occurred during the year, the case mortality being thus 92·3 per cent. The single case which recovered was bubonic in type with cutaneous manifestations.

The year shows by far the lowest number of cases of plague recorded since the disease first appeared in 1914. Nine of the cases occurred during the first five months of the year, after which there was an interval of freedom from both human and rat plague until September 3, i.e., 13 weeks, when an infected rat was found. (See Diagram IV.)

In the writer's opinion there are strong grounds for concluding that plague was eradicated from Colombo in May, i.e., during the off season, and that a very active strain of infection was re-introduced from abroad, in September, *via* the Port and the Granaries and thence to the town. In support of this conclusion is the fact that no rat plague was found, although specially searched for by Dr. Hirst, between February 19 and September 3, and that of the total of 5 rat cases which were found during the last four months of the year, 1 was caught on a grain barge in the harbour, another in the Customs warehouse, and the other 3 in the area adjacent to the harbour. The chain of evidence of infection from grain ships in the harbour, *via* grain barges, to the Customs warehouses, thence to the granaries, and from there to the town, is thus complete. This evidence is strengthened by the experience during the first two months of the current year (1927), when no fewer than 19 infected rats have been found, of which 1 was in a grain barge in the harbour, 1 was in the Customs warehouse, and 4 were in the Chalmers Granaries, while of the remaining 13 which were found in the town, 5 occurred in private grain stores supplied from the Granaries, 3 were in premises adjoining grain, or grain-bag stores, and 5 were in premises within the same area as these stores.

*Seasonal Incidence of Plague.*—Diagram IV. shows the seasonal incidence during 1926 and the average incidence during the previous ten years.

Further details are given in the accompanying statements and on Spot Map I.

(24) Annual Incidence of Human Plague Cases.

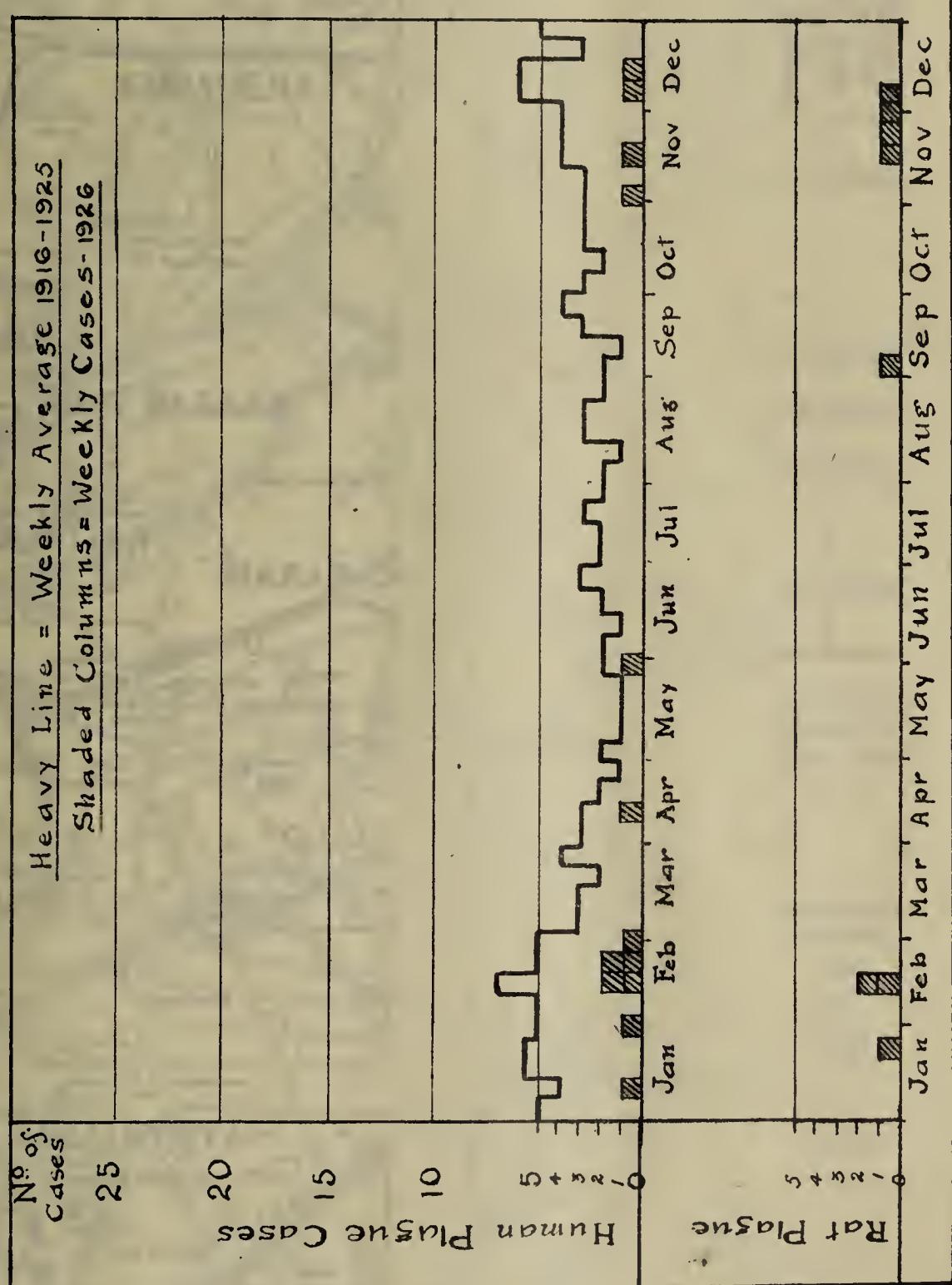
	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	Average, 1916-1925.	1926.
Total cases ...	413	139	291	207	70	87	235	184	136	230	148	64	165	13
Total deaths ...	381	128	273	196	69	82	223	170	131	209	140	58	155	12
Septicæmic cases ...	247*	81*	159	124	41	50	93	70	57	66	47	18	73	2
Septicæmic deaths ..	246	80	159	124	41	50	93	70	57	66	47	18	73	2
Bubonic cases ...	166	58	132	83	29	37	142	114	79	164	94	45	92	11
Bubonic deaths ...	135	48	114	72	28	32	130	100	74	143	86	40	82	10
Pneumonic cases ...	—	—	—	—	—	—	—	—	—	—	7	—	?	—
Pneumonic deaths ..	—	—	—	—	—	—	—	—	—	—	7	—	?	—
Cutaneous cases ...	—	—	—	—	—	—	—	—	—	—	—	1	?	—
Cutaneous deaths ...	—	—	—	—	—	—	—	—	—	—	—	—	?	—
Total case mortal- ity per cent. ...	92·2	92·8	93·8	94·7	98·6	94·3	94·9	92·4	96·3	90·9	94·5	90·6	93·9	92·3
Septicæmic case mortality per cent. ...	99·6	98·7	100	100	100	100	100	100	100	100	100	100	100	100
Bubonic case mor- tality per cent ...	81·3	82·7	86·4	86·7	96·6	86·5	91·5	87·7	93·8	87·2	91·5	88·9	89·1	90·9
Pneumonic case mortality per cent.	—	—	—	—	—	—	—	—	—	—	100	—	100	—

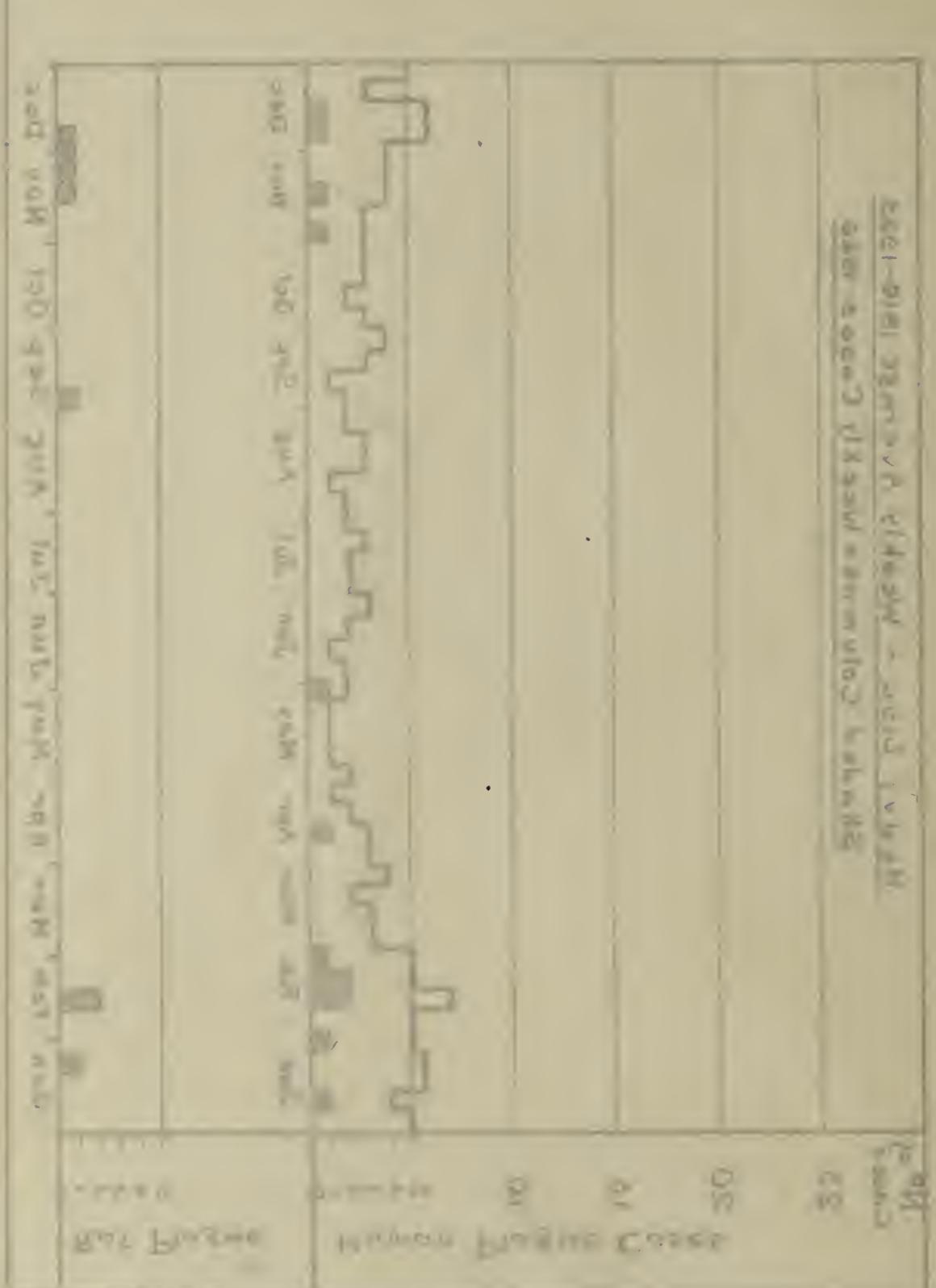
\* The cases for 1914 and 1915 each includes one septicæmic recovery, but the diagnosis in either case was not confirmed bacteriologically and may have been erroneous.

(25) Monthly Incidence of Human Plague Cases.

	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	Average, 1916-1925.	1926.
January ...	4	19	17	25	13	—	25	65	13	28	46	5	24	1
February ...	67	6	18	40	18	1	20	53	10	32	22	6	22	4
March ...	58	3	18	61	10	3	3	27	6	11	7	8	15	2
April ...	28	3	14	34	11	—	3	7	2	17	24	6	12	1
May ...	29	3	11	11	2	—	4	2	7	9	9	1	6	—
June ...	49	1	36	3	9	—	3	1	8	10	6	10	9	1
July ...	47	5	43	6	2	—	12	3	10	21	11	8	12	—
August ...	40	20	35	1	1	2	7	2	7	23	5	8	9	—
September ...	18	21	25	3	—	5	18	2	7	26	3	5	9	—
October ...	23	24	24	7	—	18	28	9	14	12	3	1	12	—
November ...	24	10	25	10	2	34	34	4	19	13	8	5	15	2
December ...	26	24	25	6	2	24	78	9	33	28	4	1	21	2
Total for the year ...	413	139	291	207	70	87	235	184	136	230	148	64	165	13
Monthly mean ...	34·4	11·6	24·3	17·3	5·8	7·3	19·6	15·3	11·3	19·2	12·3	5·3	13·8	1·1

DIAGRAM N° IV  
PLAQUE CASES





БІЛСОУЕ СВАЕС  
ДІВЕРМІН МІЗ ІК

# SPOT MAP NO 1

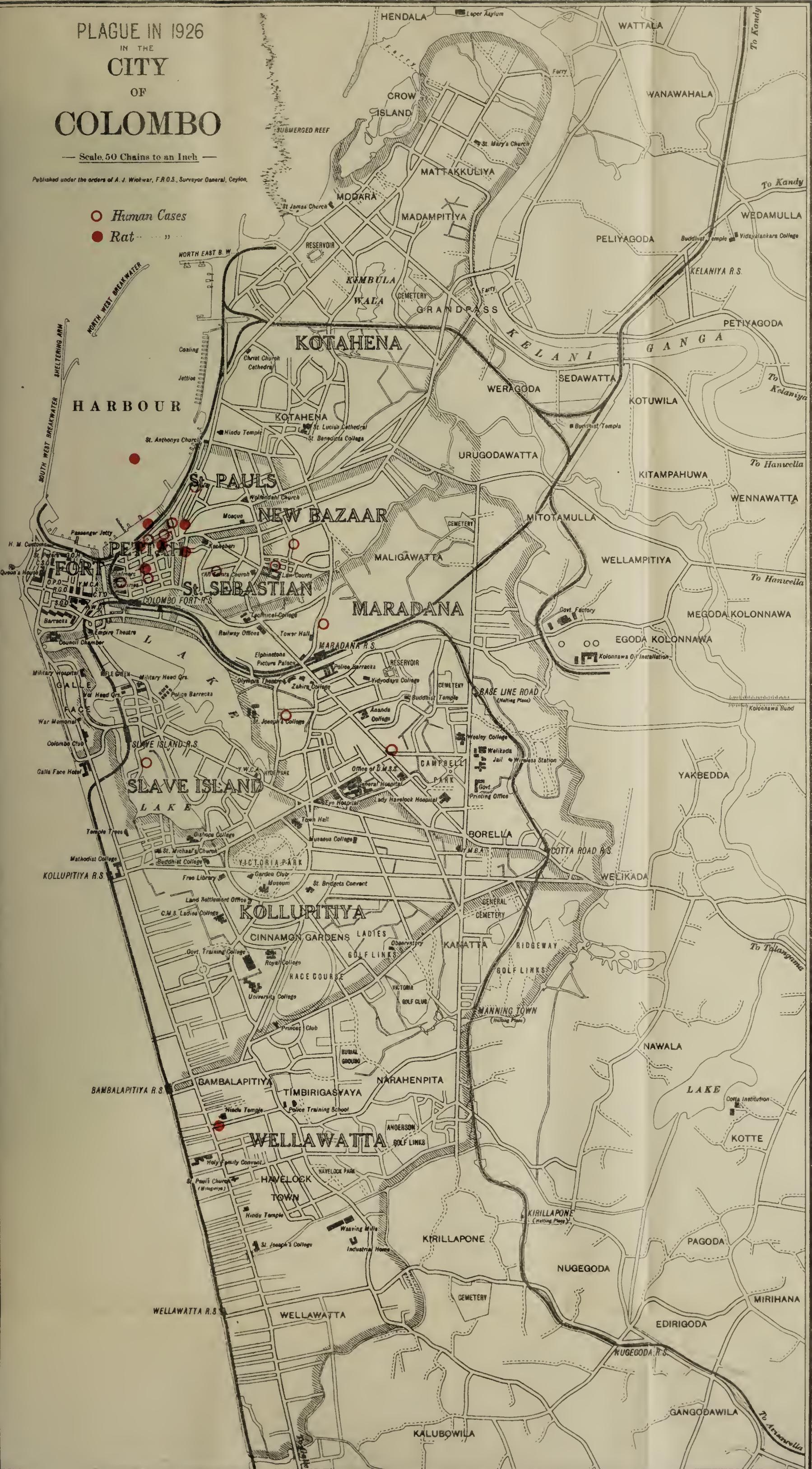
## PLAQUE IN 1926 IN THE CITY OF COLOMBO

— Scale, 50 Chains to an Inch —

Published under the orders of A. J. Wickwar, F.R.O.S., Surveyor General, Ceylon.

○ Human Cases

● Rat





(26) *Plague during the Year 1926, by Wards.*

Ward.	Cases.	Deaths.	Ward.	Cases.	Deaths.
Fort	...	—	Slave Island	...	1
Pettah	...	4	Kollupitiya	...	—
San Sebastian	...	—	Cinnamon Gardens	...	—
St. Paul's	...	1	Bambalapitiya	...	—
Kotahena	...	—	Timbirigasyaya	...	—
Mutwal	...	—	Wellawatta	...	—
New Bazaar	...	2	No fixed residence	...	2
Maradana North	...	1	Total	...	13
Maradana South	...	1			12
Dematagoda	...	1			—

(27) *Human Plague in Colombo during the Year 1926.—Distribution by Race, Sex, and Age.*

Race.	Sex.	0 to 5 Years.	5 to 10 Years.	10 to 15 Years.	15 to 20 Years.	20 to 25 Years.	25 to 30 Years.	30 to 35 Years.	35 to 40 Years.	40 to 50 Years.	50 to 60 Years.	60 Years and Over.	Total.	Total of each Race.	Case-rate per 1,000 Population.	No. of deaths (inclusive of deaths of Colombo cases at I.D.H.)	Case Mortality per Cent.	Death-rate per 1,000 Population.
All Races	{ Males	—	1	4	4	—	—	1	1	1	1	—	13	{ 13	0·050	12	92·3	0·046
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Europeans	{ Males	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Burghers	{ Males	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sinhalese	{ Males	—	1	2	—	—	—	—	—	—	1	—	4	{ 4	0·033	4	100	0·033
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tamils	{ Males	—	—	—	3	—	—	—	—	—	—	—	3	{ 3	0·052	3	100	0·052
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Moors	{ Males	—	—	—	2	—	—	—	1	—	—	—	3	{ 3	0·071	3	100	0·071
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malays	{ Males	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Others	{ Males	—	—	—	1	—	—	1	—	1	—	—	3	{ 3	0·233	2	66·7	0·155
	{ Females	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

*Rat Plague.*—A total of 129,361 rodents was accounted for during the year, of which 22,701 were examined at the Bacteriological Laboratory with the result that only 8 were found to be plague infected, the infection rate being thus 0·04 per cent., as compared with 0·06 per cent. in 1925.

(28) *Statement showing Rats examined at the Laboratory, Number found infected, and Percentage Infection.*

Month.	No. of Rats examined.	Number infected.	Percentage Infection.	Month.	No. of Rats examined.	Number infected.	Percentage Infection.
January	2,021	1	0·05	September	1,975	1	0·05
February	1,950	2	0·1	October	1,796	—	—
March	2,142	—	—	November	2,062	3	0·15
April	1,350	—	—	December	2,831	1	0·04
May	1,447	—	—	Total	22,701	8	0·04
June	1,571	—	—				
July	1,721	—	—				
August	1,835	—	—				

(29) *Distribution of Rodents examined for Plague in 1926.*

	Species.	Number examined.	Number infected.	Percentage infected.
Trapped rats	{ R. Rattus	16,702	3	0·02
	{ R. Norvegicus	3,065	0	—
	{ M. Musculus	816	0	—
	{ Bandicoots	2	0	—
Rats found dead	{ R. Rattus	29	0	—
	{ R. Norvegicus	40	4	10·0
	{ M. Musculus	4	1	25·0
	{ Bandicoots	1	0	—
Rats killed by Claytons	{ R. Rattus	514	0	—
	{ R. Norvegicus	935	0	—
	{ M. Musculus	591	0	—
	{ Bandicoots	2	0	—
	Total	22,701	8	0·04

*Preventive Measures.*—The same preventive measures as described in the 1925 Report were adopted, an intensive campaign against rats and rat fleas being carried on throughout the year, including the plague "off season."

From what has already been said it seems clear that if Colombo is to be freed and kept free of plague, re-introduction of infection from abroad must be prevented. It is not possible to "build out" the rat here.

The only way to ensure exclusion of plague would appear to be the disinfection of all grain prior to its being landed at the Port. Dr. Hirst has pointed out that although, according to Otten, the plague rat of Rangoon appears to be *ratus concolor*, this species very rarely occurs in Colombo, only one specimen having, in fact, being found so far. This would appear to bear out the conclusion long since arrived at here, that plague is introduced into Colombo chiefly, if not entirely, by infected rat fleas and not by rats, hence the paramount necessity for disinfecting consignments of imported grain and grain sacks. The question of introducing such a measure at the Port of Colombo, e.g., by the use of cyanide gas, has been under consideration for some time, but has not, so far, been regarded favourably by the Port Commission, owing, it is understood, partly to the risk to life and partly to the disturbance of commerce which would be entailed in carrying out such a measure.

(30) *Rats trapped, killed by Claytons, and found Dead during 1926.*

Month.	Number of Rats trapped.				Number of Rats killed by Claytons.	Mummified Rats (Plague Inspector).	Number of Dead Rats found.				Total.
	Veterinary Surgeon.	Chalmers* Granaries.	Manning* Market.	Veterinary Surgeon.			Plague Inspector.	Chalmers* Granaries.	Manning* Market.		
January	12,158	268	130	126	1	—	2	2	—	12,687	
February	10,839	273	90	105	—	1	3	—	—	11,311	
March	11,639	190	84	157	1	—	1	—	—	12,072	
April	10,469	144	65	123	—	4	—	—	—	10,805	
May	11,473	121	66	40	—	—	—	1	—	11,701	
June	10,258	164	73	96	—	—	3	—	—	10,594	
July	9,390	166	68	103	—	—	4	—	1	9,732	
August	10,763	226	76	125	—	3	2	1	—	11,196	
September	10,711	221	73	121	3	9	7	—	—	11,145	
October	9,355	219	74	81	1	2	2	3	—	9,737	
November	8,569	223	74	276	4	1	7	2	—	9,156	
December	8,584	369	75	185	4	—	4	4	—	9,225	
Total	124,208	2,584	948	1,538	14	20	35	13	1	129,361	

\* Figures supplied by the Chairman, Board of Immigration and Quarantine, Colombo.

During the year 1926 there were placed 1,693,945 poisoned baits. Of these, 66,085 were removed or eaten by rats.

(31) *Work done by the Plague Staff during the Year 1926.*

Ward.	No. of Dwellings Claytonized.	No. of Dwellings Unroofed.	No. of Rat Holes Claytonized.	No. of Rats killed by Claytons.	No. of Recently Dead Rats found	No. of Mummified Rats found.	No. of Dwellings Pesterined.	No. of Dwellings Disinfected.	No. of Rat Nests found.	No. of Cart Loads of Rubbish removed.
Fort	13	13	104	3	—	—	1	4	—	4
Pettah	1,495	1,495	2,164	402	14	5	237	1,219	—	139 $\frac{1}{4}$
San Sebastian	496	496	879	67	—	—	292	196	—	47 $\frac{1}{4}$
St. Paul's	3,581	3,581	3,816	309	10	4	1,758	2,730	—	184 $\frac{1}{2}$
Kotahena	491	491	791	88	2	—	311	176	—	40
Mutwal	704	704	1,111	71	—	—	429	279	—	36 $\frac{3}{4}$
New Bazaar	1,904	1,904	2,564	160	2	1	1,164	651	—	111 $\frac{3}{4}$
Maradana North	52	52	78	32	—	1	37	15	—	17 $\frac{1}{2}$
Maradana South	1,422	1,422	2,849	180	—	1	842	505	—	152 $\frac{1}{2}$
Dematagoda	92	92	284	45	—	—	45	40	—	6 $\frac{3}{4}$
Slave Island	950	950	1,681	123	4	—	535	394	—	80 $\frac{3}{4}$
Kollupitiya	730	730	1,748	21	1	2	100	583	—	129
Cinnamon Gardens	2	2	25	2	—	—	—	—	—	—
Bambalapitiya	65	65	189	3	—	—	36	22	—	10 $\frac{1}{2}$
Timbirigasyaya	—	—	—	—	—	—	—	—	—	—
Wellawatta	43	43	139	32	2	—	22	9	—	6
Total	12,040	12,040	18,422	1,538	35	14	5,809	6,823	—	966 $\frac{1}{2}$

## XI.—CHOLERA.

No case of cholera occurred during the year.

## XII.—SMALLPOX AND VACCINATION.

Ten cases of smallpox occurred in the town, and ten were landed from ships in the harbour.

As regards the town cases, an isolated case occurred in February, the patient having been infected at Nagoor in India, and arrived in Colombo during the incubation period, importation being the invariable history of first cases in Colombo. As regards the other nine town cases a full report (No. 245 of November 2, 1926) has already been submitted. They originated from two simultaneous cases which have apparently been infected at Ajmir in India, and arrived in Colombo, *via* Mandapam Camp, while in the incubation stage. These two cases developed the disease on September 4, in one of the most densely crowded tenement areas in the town, and were not discovered until September 13, but fortunately by the adoption of vigorous measures, including mass vaccination and daily surveillance, only seven further cases occurred, of which one developed the disease in the Segregation Camp and the other six in two widely separated parts of the town. In connection with this outbreak 2,046 vaccinations, including 1,949 re-vaccinations, were carried out by the Public Health Department staff in the three infected areas. Only sixty-six persons who had been specially exposed to infection were sent to the Segregation Camp, but several thousands were kept under a daily surveillance at their homes, with permission to carry on their work. Two officers of the Department were specially commended in connection with this outbreak, viz., Sanitary Inspectress Mrs. Balmond and Health Visitor Miss Schokman.

*Vaccination.*

The following statement shows the state of vaccination during 1926 :—

(32) *Details of Vaccinations performed during the Year 1926.*

## (a) By Government Vaccinators.

Ward.		Number of Primary Vaccinations.		Number of Re-vaccinations.		Total.
Fort, Pettah, and San Sebastian	...	561	...	6	...	567
St. Paul's	...	807	...	1	...	808
Kotahena	...	590	...	1	...	591
New Bazaar	...	437	...	—	...	437
Maradana	...	626	...	208	...	834
Slave Island	...	571	...	65	...	636
Bambalapitiya and Kollupitiya	...	844	...	275	...	1,119
Timbirigasyaya	...	595	...	21	...	616
Itinerating (Colombo)	...	469	...	—	...	469
Total	...	5,500		577		6,077

## (b) By Public Health Department Staff

Ward.		Number of Primary Vaccinations.		Number of Re-vaccinations.		Total.
Fort	...	—	...	9	...	9
Pettah	...	—	...	27	...	27
San Sebastian	...	39	...	1,372	...	1,411
New Bazaar	...	72	...	766	...	838
Maradana North	...	12	...	311	...	323
Kollupitiya	...	—	...	3	...	3
Total	...	123		2,488		2,611

*Births and Primary Vaccinations in 1926.*

The following statement shows the relation between the number of births recorded and the number of primary vaccinations performed. It discloses an even greater deficit of primary vaccinations than during the previous year :—

(33) *Vaccinations, 1920 to 1926.*

Year.	No. of Births.	Number of Primary Vaccinations.	Deficit of Primary Vaccinations.	Excess of Primary Vaccinations.
1920	7,197	7,159	38	—
1921	8,724	6,162	2,562	—
1922	6,881	7,240	—	359
1923	7,107	6,192	915	—
1924	6,887	5,784	1,103	—
1925	7,663	5,704	1,959	—
1926	8,114	5,623	2,491	—

## XIII.—CHICKENPOX.

There was a marked reduction in the incidence of chickenpox, with 1,045 town cases during 1926 as compared with 1,703 cases during the previous year. No death was ascribed to this cause. The peculiarity of the age distribution of chickenpox cases here, as compared with Europe, to which attention was drawn in the 1925 Report, is again demonstrated by the following statement which shows that the incidence falls chiefly at ages over ten years and under thirty-five years, with however a considerable number over fifty years of age.

(34) *Chickenpox in Colombo Town during the Year 1926. (Town Cases.)*

## Distribution according to Age.

Under 1 year	...	3	25 years and under 30	...	188
1 year and under 2	...	5	30 years and under 35	...	121
2 years and under 3	...	7	35 years and under 40	...	72
3 years and under 4	...	8	40 years and under 50	...	72
4 years and under 5	...	5	50 years and under 60	...	23
5 years and under 10	...	35	60 years and under 70	...	7
10 years and under 15	...	93	70 years and over	...	5
15 years and under 20	...	166		Total	...
20 years and under 25	...	235			1,045

## XIV.—MEASLES.

This disease also showed some improvement compared with the previous year, there being 518 town cases recorded, as against 627 in 1925. Four deaths were ascribed to this cause.

## XV.—DIPHTHERIA.

Diphtheria with 17 town cases shows a slight increase compared with 14 cases in 1925.

## XVI.—DIARRHŒA AND DYSENTERY.

These diseases are not notifiable, but the death returns quoted below and Diagram V. show a slight increase of mortality from diarrhœa, and a slight decrease of dysentery mortality. The diagram shows the progressively downward trend of the mortality from these causes which occurred from 1907 until 1919, when there was a set back, associated apparently with influenza, from which the town has not yet quite recovered.

(35) *Diarrhoeal Diseases, 1926, by Race. Death-rate per 1,000 Population.*

	All Deaths	Euro- peans	Bur- ghers	Sin- halese	Tamils	Moors	Malays	Others
Diarrhoea and Enteritis	575	2	22	343	112	69	12	15
	Death-rate	2.22	0.665	1.40	2.82	1.95	1.64	1.93
Dysentery	213	1	3	125	52	23	1	8
	Death-rate	0.82	0.33	0.19	1.03	0.91	0.55	0.16
All Diarrhoeal...	788	3	25	468	164	92	13	23
	Death-rate	3.04	1.00	1.59	3.85	2.86	2.19	1.78

## XVII.—ENTERIC FEVER.

477 cases of enteric fever (including paratyphoid) were recorded in 1926, but of these only 249 or 52.2 per cent. were town cases, 223 having been admitted to the hospitals from districts outside the town, and 5 from ships in the harbour, i.e., a total of 228 or 47.8 per cent. were of extra-urban origin.

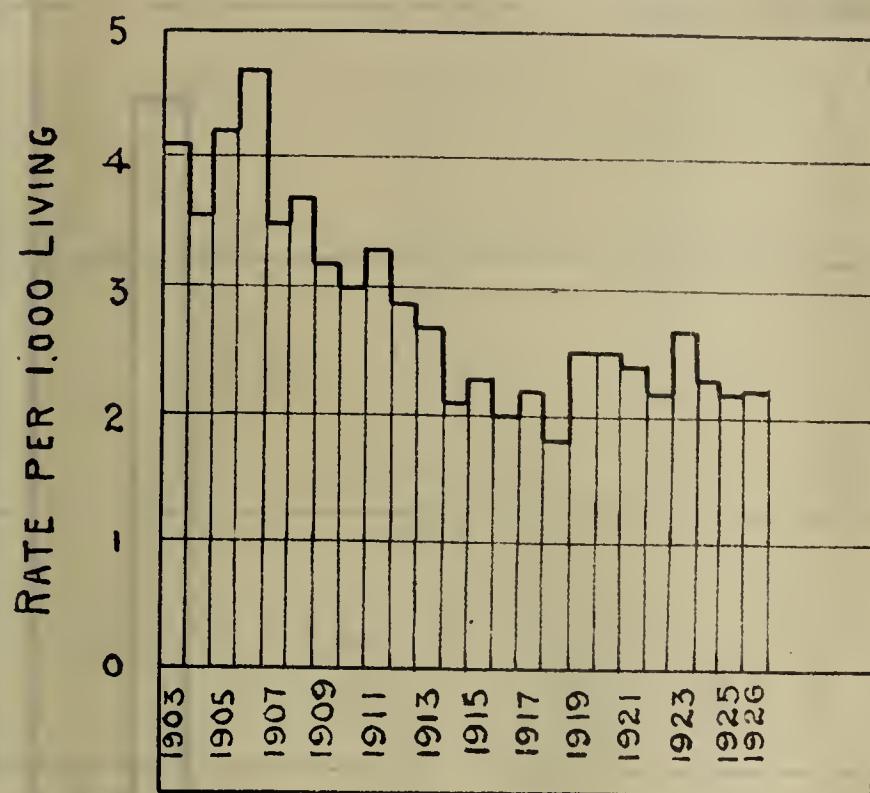
There was thus a great improvement as regards the town incidence compared with the previous year, when there were 473 town cases, 266 outside cases, and 16 port cases. As Diagram VI. and Statement 22 show only once since notification of enteric was enforced in 1903 has such a small number of town cases been recorded, viz., in 1914, when the number was 229. The sudden reduction in 1914, was, without doubt, in a large measure, due to the panic created by the appearance of plague that year, fear of which disease put a stop, to a great extent, to the custom which prevails here of visiting sick friends and relatives and partaking of refreshments in their houses, a custom which, as pointed out in previous reports, is responsible for the spread of much infection amongst the poorer classes. In striking contrast to the 1914 experience was the great increase of enteric which occurred during the latter half of 1919 and throughout 1920, as the result of the unprecedented mixing up of all classes of the population at the food depôts during the rice famine in 1919. The improvement in 1926, on the other hand, is believed to have been to a large extent due to the special measures which were initiated in the middle of 1925 and were continued in 1926, to prevent the dumping of domestic refuse within the town, especially in proximity to dwellings. This action undoubtedly had a great effect in reducing the fly nuisance, and the consequent spread of infection by these pests. This unauthorized dumping of refuse is a source of considerable danger which is constantly liable to recur and requires rigorous prohibition and careful watching.

*Local Incidence of Enteric in 1926.*

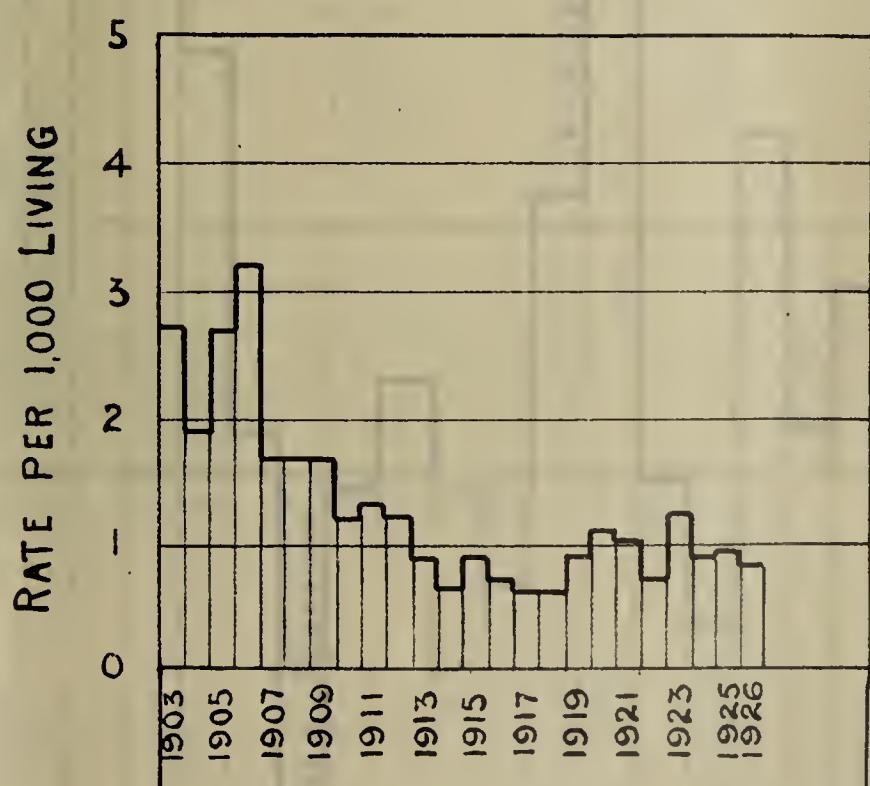
As Spot Map II. shows the distribution of enteric cases in 1926, was, for the most part, very sporadic, only two small localized series of cases having occurred, viz., one within the Welikada prison and the other at Piachaud's lane, shown on map near the Tower Hall. The prison series is interesting for the reason that investigation by this department led to the discovery of a very active carrier, in the person of an apothecary employed in the prison who had suffered from an attack of enteric fever about four years previously. Upon this man being proved to be a carrier, he was granted six months' leave by his department to enable him to undergo treatment with a view of eliminating the infection. The last case in this series occurred on July 16, prior to the removal of this carrier.

## DIAGRAM NO V

(a) DIARRHOEA & ENTERITIS. 1903 - 1926  
DEATH RATE PER 1,000 LIVING

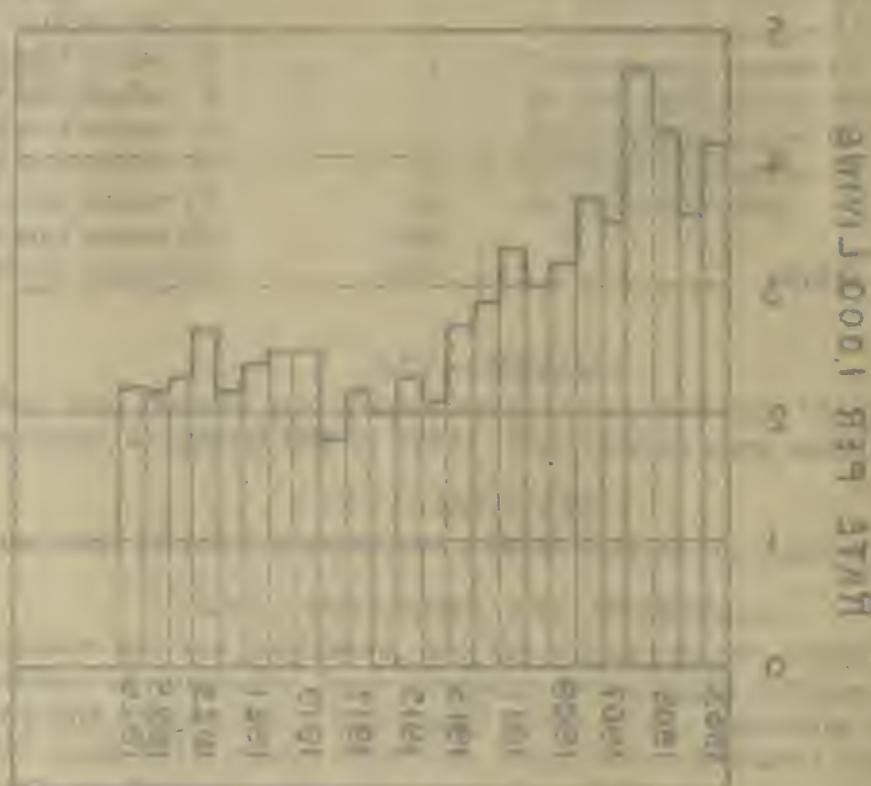


(b) DYSENTERY. 1903 - 1926  
DEATH-RATE PER 1,000 LIVING

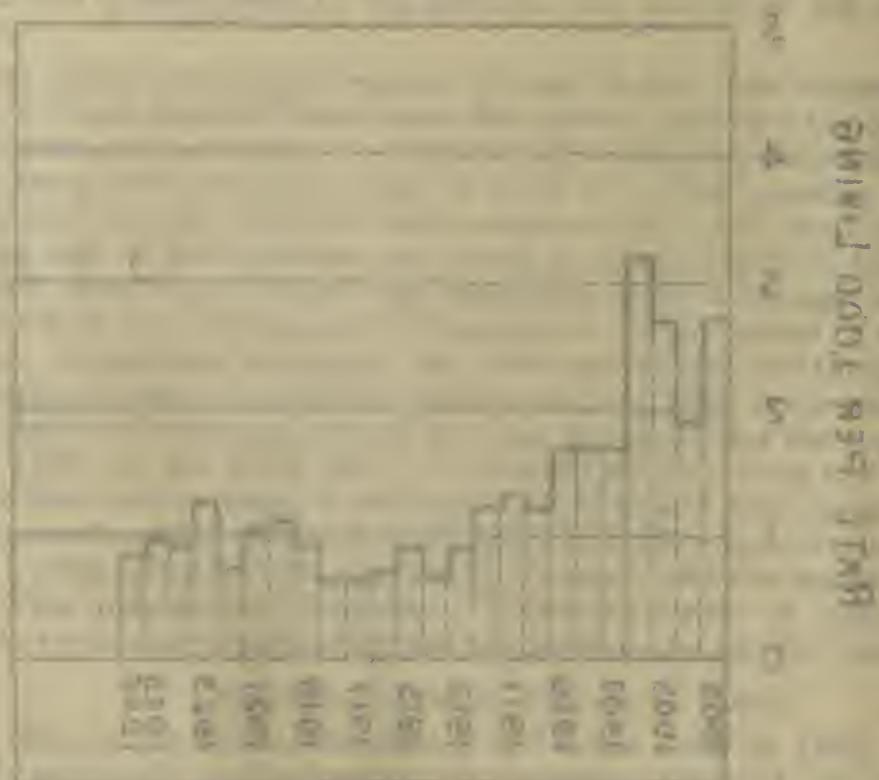


## DIAGRAMA

(P) DISFONTELA 1907 - 1926  
DETALHES DA MORTALIDADE NOS HABITANTES DE 1000 FAMÍLIAS



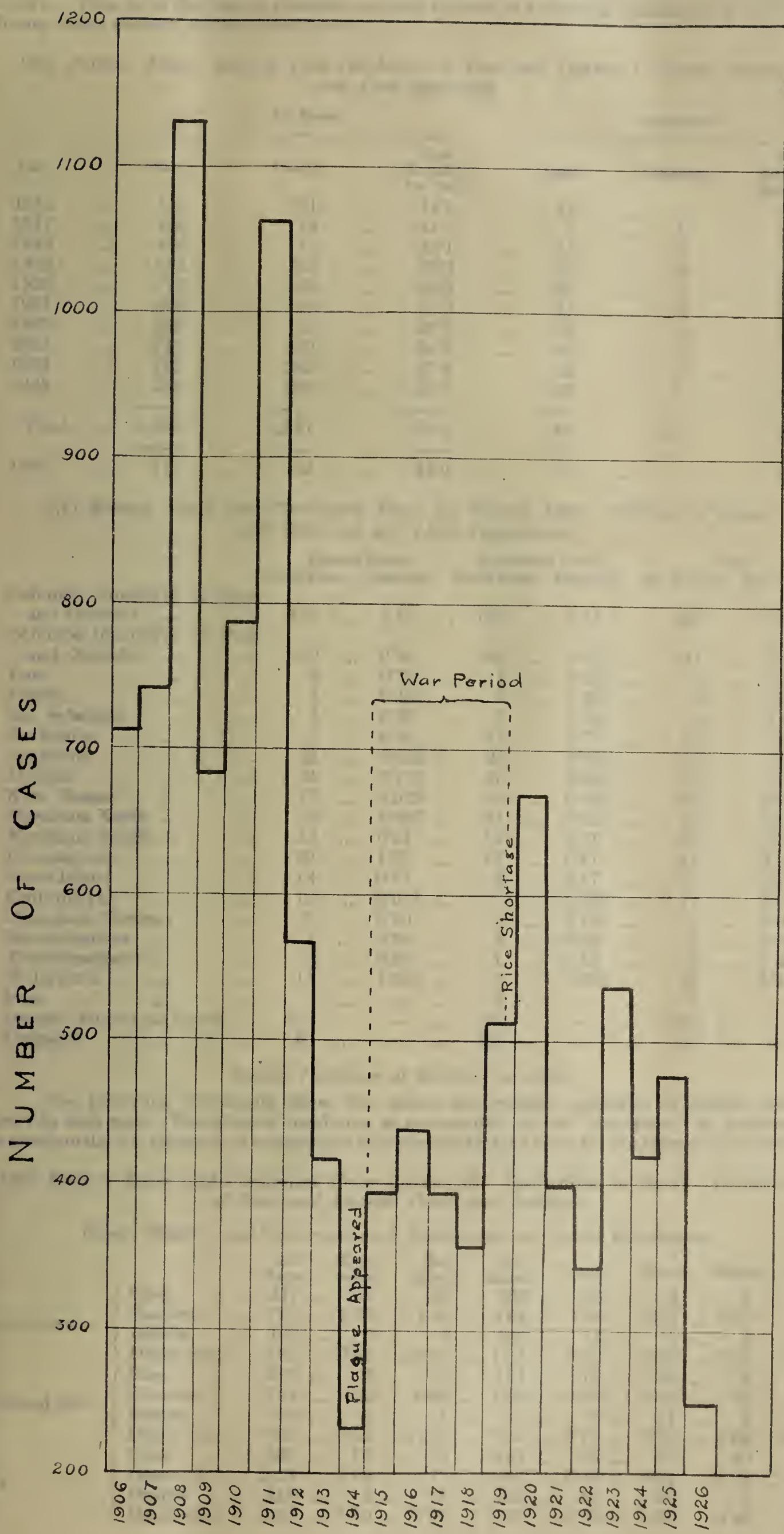
(P) DISFONTELA 1907 - 1926  
DETALHES DA MORTALIDADE NOS HABITANTES DE 1000 FAMÍLIAS



## DIAGRAM N° VI

## ENTERIC FEVER (TOWN CASES ONLY)

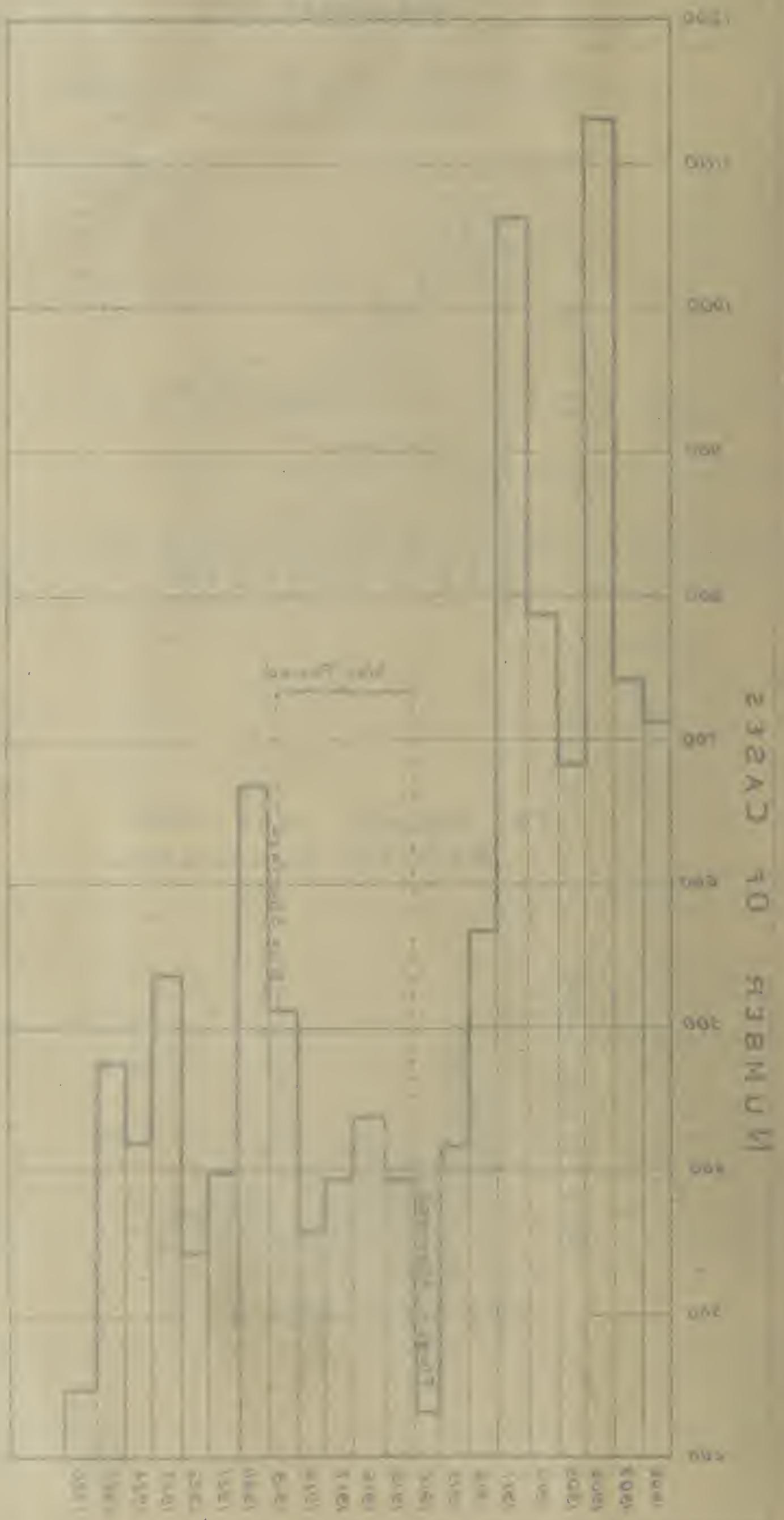
1906 to 1926



DRAGGAW HILL

ENTRANCE NUMBER (Lower Case Only)

LINE = 100E



The other small series of cases, shown on the Spot Map near the Tower Hall, was an example of family infection from case to case. The Spot Map also shows the complete freedom from enteric of the greater part of the Cinnamon Gardens, which is the best residential quarter of the town. This, as in the case of phthisis, referred to later, is a striking illustration of the benefits of living under modern sanitary conditions.

(36) *Enteric Fever, 1916 to 1926 (inclusive of Port and Outside.) Cases, Deaths, and Case Mortality.*

Year.	All Races.				Europeans.			
	Cases.	Deaths.	Case Mortality. Per Cent.	Cases.	Deaths.	Case Mortality Per Cent.		
1916	515	231	44.9	12	2	16.7		
1917	424	174	41.0	7	1	14.3		
1918	430	181	42.1	14	3	21.4		
1919	682	268	39.3	35	9	25.7		
1920	879	338	38.5	32	5	15.6		
1921	572	219	38.3	17	3	17.6		
1922	498	179	36.0	18	5	27.8		
1923	741	269	36.2	19	3	15.8		
1924	702	263	37.4	12	5	41.7		
1925	755	269	35.6	22	5	22.7		
Total	6,198	2,391	38.6	188	41	21.8		
1926	477	162	34.0	10	2	20.0		

(37) *Enteric Fever and Continued Fever by Wards, 1926. Number of Cases and Case-rate per 1,000 Population.*

	Enteric Fever		Continued Fever		Total	
	No. of Cases.	Case-rate.	No. of Cases.	Case-rate.	No. of Cases.	Case-rate.
Colombo (inclusive of Port and Outside) ...	477	1.84	190	0.74	667	2.58
Colombo (exclusive of Port and Outside) ...	249	0.96	168	0.65	417	1.61
Fort ...	2	0.70	1	0.35	3	1.05
Pettah...	4	0.496	4	0.496	8	0.99
San Sebastian ...	4	0.33	2	0.16	6	0.49
St. Paul's ...	7	0.28	18	0.73	25	1.01
Kotahena ...	24	0.823	29	0.995	53	1.82
Mutwal ...	34	1.716	16	0.808	50	2.52
New Bazaar ...	13	0.525	10	0.404	23	0.93
Maradana North ...	28	1.225	21	0.919	49	2.14
Maradana South ...	12	0.61	14	0.71	26	1.32
Dematagoda ...	32	1.73	15	0.81	47	2.54
Slave Island ...	13	0.57	4	0.17	17	0.74
Kollupitiya ...	10	0.658	6	0.395	16	1.05
Cinnamon Gardens ...	9	0.90	1	0.10	0	1.00
Banibalapitiya ...	2	0.20	3	0.30	5	0.50
Timbirigasyaya ...	2	0.30	1	0.15	3	0.40
Wellawatta ...	13	1.133	3	0.262	16	1.45
Port ...	5	—	2	—	7	—
Outside Municipal limits ...	223	—	20	—	243	—
Untraced ...	40	—	20	—	60	—

*Racial Incidence of Enteric in 1926.*

The following statements show the actual and relative incidence of enteric fever as reported in each race. The relative incidence, as represented by the "case-rates," is, however, far from trustworthy for purposes of comparison between the various races for the reasons given later:—

(38) *Enteric Fever and Continued Fever during the Year 1926, by Race. (Inclusive of Port and Outside Cases and Deaths.)*

*Cases, Deaths, and Case-rates and Death-rates per 1,000 Population.*

	All Races.	Euro- peans.	Bur- ghers.	Sin- halese.	Tamils.	Moors.	Malays.	Others.
Enteric fever ...	Cases ...	477	10	30	369	22	9	6 ... 31
	Case-rate ...	1.84	3.33	1.90	3.04	0.38	0.21	0.97 ... 2.40
	Deaths ...	162	2	8	123	13	5	1 ... 10
	Death-rate ...	0.62	0.67	0.51	1.01	0.23	0.12	0.16 ... 0.775
Continued fever.	Cases ...	190	2	13	124	16	18	4 ... 13
	Case-rate ...	0.74	0.66	0.82	1.02	0.28	0.43	0.64 ... 1.01
	Deaths ...	56	1	1	32	6	11	4 ... 1
	Death-rate ...	0.22	0.33	0.063	0.26	0.10	0.26	0.64 ... 0.078
Total	Cases ...	667	12	43	493	38	27	10 ... 44
	Case-rate ...	2.58	3.99	2.73	4.06	0.66	0.64	1.61 ... 3.41
	Deaths ...	218	3	9	155	19	16	5 ... 11
	Death-rate ...	0.84	1.00	0.57	1.28	0.33	0.38	0.80 ... 0.85

## MUNICIPALITY OF COLOMBO.

(39) Enteric Fever by Race during the Year 1926. Case and Case-rate for—

(a) All Town Cases. (b) Town Cases exclusive of Cases infected Outside Town.

Race.	(a) All Town Cases.			(b) Town Cases (exclusive of Cases Infected Outside Town).		
	No. of Cases.	Case-rate per 1,000 Population.	No. of Cases.	Case-rate per 1,000 Population.		
All Races ...	249	0'96	226	0'87		
Europeans ...	5	1'66	3	1'00		
Burghers ...	26	1'65	24	1'52		
Sinhalese ...	163	1'34	151	1'24		
Tamils ...	16	0'28	12	0'21		
Moors ...	8	0'19	8	0'19		
Malays ...	6	0'97	6	0'97		
Others ...	25	1'94	22	1'71		

(40) Enteric Fever among Europeans, 1916 to 1925 (10 Years). Cases, Deaths, and Case Mortality among Town, Port, and Outside Cases.

	Town.	Port.	Outside.	Port and Outside.	Town, Port and Outside.
Number of Cases	84	85*	19†	104	188
Number of Deaths	13	23	5	28	41
Case Mortality per cent.	15'5	27'1	26'3	26'9	21'8
Total (Port and outside)	<u>94</u> males and <u>10</u> females.				

\* 79 males and 6 females among the Port cases.  
† 15 males and 4 females among the Outside cases.

(41) Enteric Fever during the Year 1926 (inclusive of Port and Outside Cases).

Distribution by Race, Sex, and Age.

Race.	Sex.	0 to 5 Years.	5 Years to 10 Years.	10 Years to 15 Years.	15 Years to 20 Years.	20 Years to 25 Years.	25 Years to 30 Years.	30 Years to 35 Years.	35 Years to 40 Years.	40 Years to 50 Years.	50 Years to 60 Years.	60 Years and Over.	Total.	Total of each Race.	Case Rate per 1,000 Population.	Number of Deaths.	Case Mortality Per Cent.	Death-rate per 1,000 Population.
All Races...	Males	5	16	37	59	50	47	39	14	17	7	6	297	477	1'84	162	34'0	0'62
	Females	9	18	34	25	27	21	17	8	13	5	3	180					
Europeans...	Males	1	—	—	—	1	1	—	—	1	—	—	4	10	3'33	2	20	0'67
	Females	2	—	—	1	—	1	1	—	—	1	—	6					
Burghers...	Males	1	1	4	6	—	—	1	1	—	2	—	16	30	1'90	8	26'7	0'51
	Females	—	1	3	2	2	1	1	2	1	—	1	14					
Sinhalese...	Males	3	11	30	41	39	36	29	10	8	5	6	218	369	3'04	123	33'3	1'01
	Females	7	16	29	22	24	18	12	6	11	5	1	151					
Tamil...	Males	—	4	1	4	3	2	1	1	1	—	—	17	22	0'38	13	59'1	0'23
	Females	—	1	1	—	1	—	2	—	—	—	—	5					
Moors...	Males	—	—	1	3	—	2	1	1	—	—	—	8	9	0'21	5	55'6	0'12
	Females	—	—	—	—	—	—	1	—	—	—	—	1					
Malays...	Males	—	—	1	1	—	1	1	—	1	—	—	5	6	0'97	1	16'7	0'16
	Females	—	—	—	—	—	1	—	—	—	—	—	1					
Others...	Males	—	—	—	4	7	5	6	1	6	—	—	29	31	2'40	10	32'3	0'775
	Females	—	—	1	—	—	—	—	1	—	—	—	2					

## Fatality of Enteric Fever.

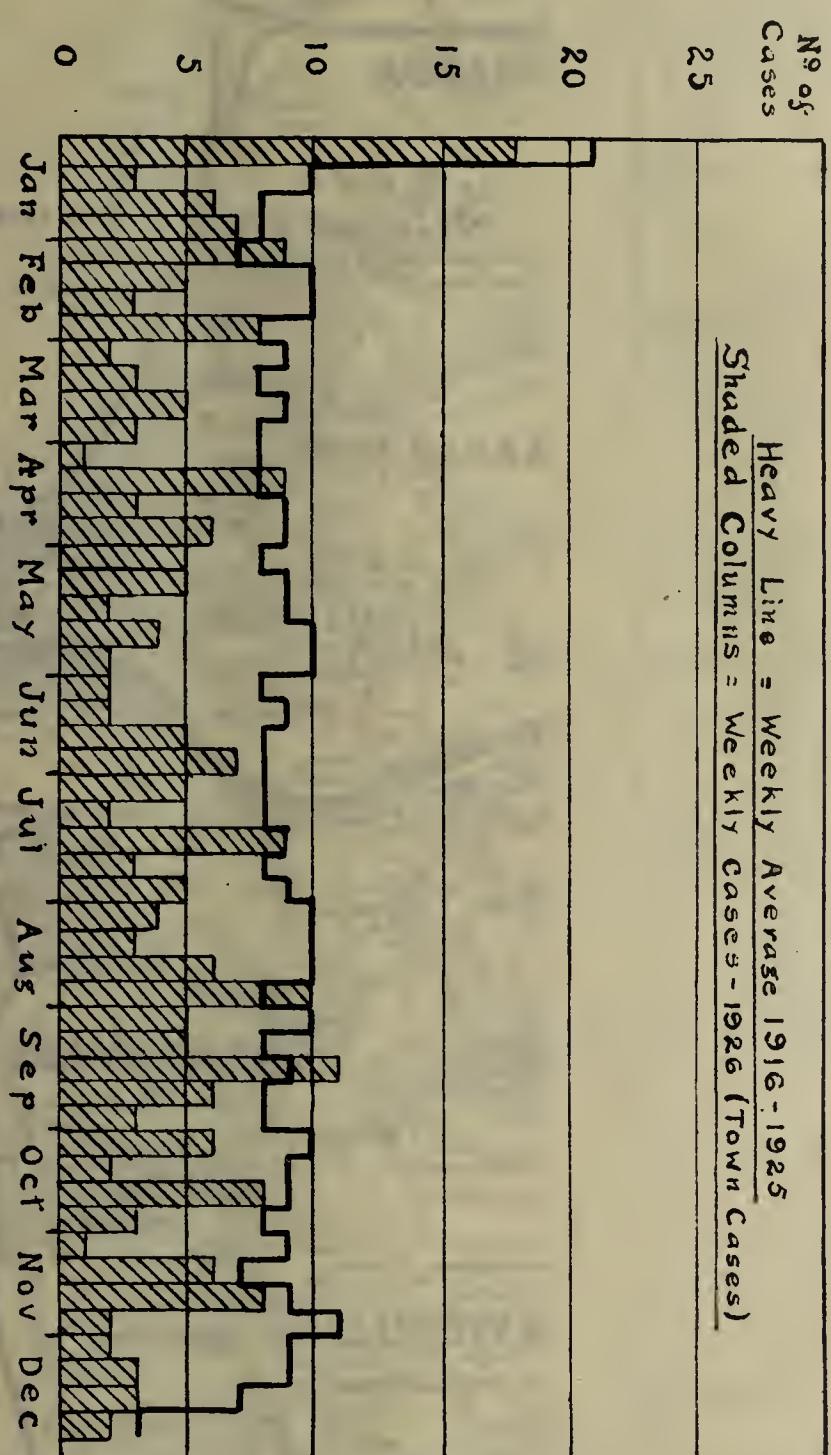
Statement 36 shows the fatality (case mortality) amongst enteric cases reported during 1926 and during each of the preceding 10 years. It will be seen that amongst all races, including Europeans, it ranged, during the 10 years 1916-1925, from 35'6 to 44'9 per cent., with an average of 38'6 per cent., whereas amongst European cases alone it ranged from 14'3 per cent. to 41'7 per cent., with an average of 21'8 per cent. The number of European cases is too small to give a reliable average for any one year, but the average of 21'8 per cent. for the whole series of 188 cases during the 10 years may be accepted as a fair indication of the fatality of enteric amongst the European cases treated in Colombo.

This average fatality of 21'8 per cent. is undoubtedly high compared with the fatality experienced in temperate climates, which is generally stated at from 12 to 15 per cent., but when the investigation is carried further, as has been done in Statement 40, an interesting fact emerges.

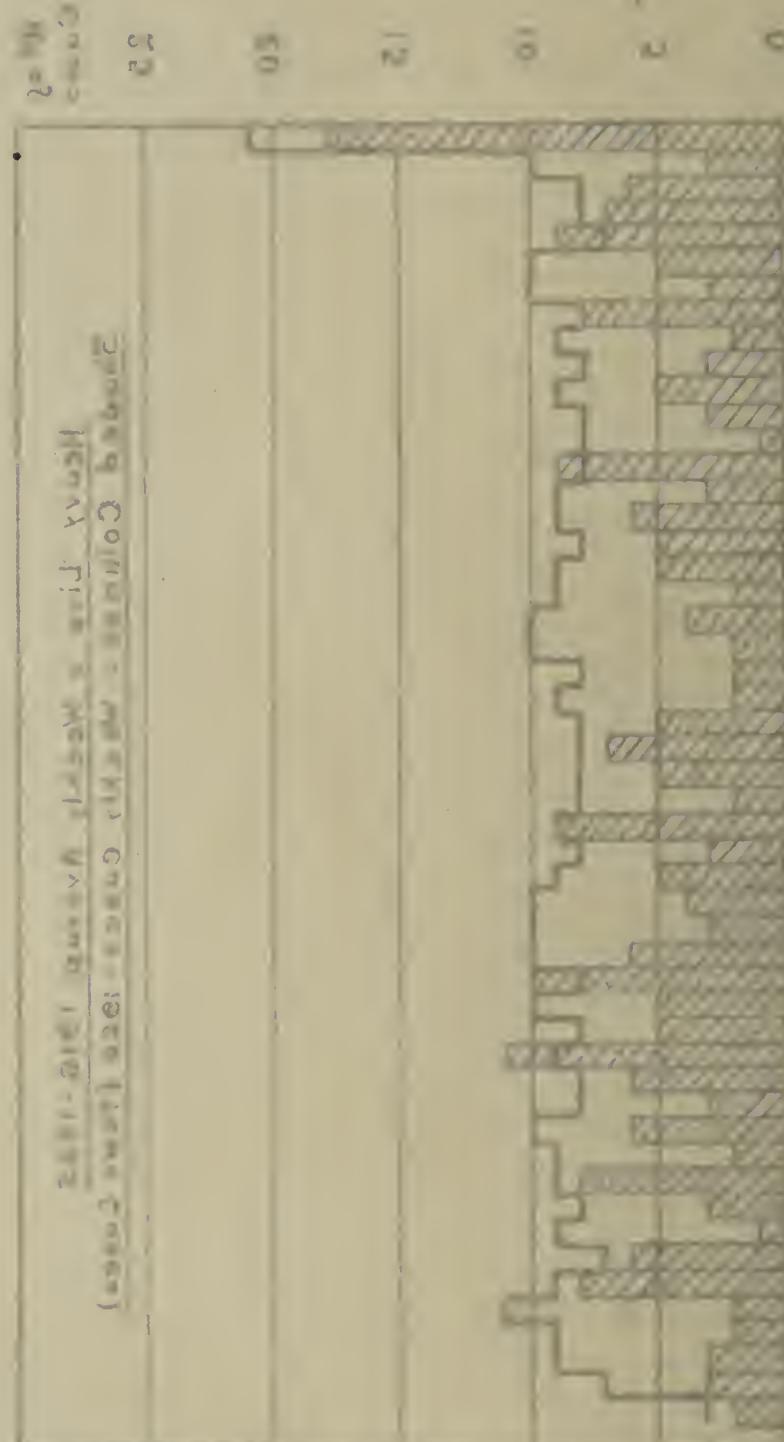
From the foregoing statements it would appear that in 1926 whereas "all races" had 1'84 cases of enteric fever per 1,000 of total population, Europeans headed the list with 3'33 cases per 1,000 of their population. That a fallacy is therein involved is indicated in Statement 36 which shows that the "fatality," i.e., the case mortality amongst reported cases in "all races" during 1926 was 34'0 per cent., whereas it was only 20'0 per cent. amongst European cases. It will also be seen that this contrast has occurred with great regularity for many years past. The reason for this difference undoubtedly is that notification is much more accurate and complete in the case of

## DIAGRAM NO. VII

### ENTERIC FEVER CASES



THE PRACTICAL USE OF THE MICROSCOPE IN DENTAL MEDICINE



ENTRÉE PARIS CHASSE

IV МАЯ 1941

**ENTERIC FEVER 1926  
IN THE  
CITY  
OF  
COLOMBO**

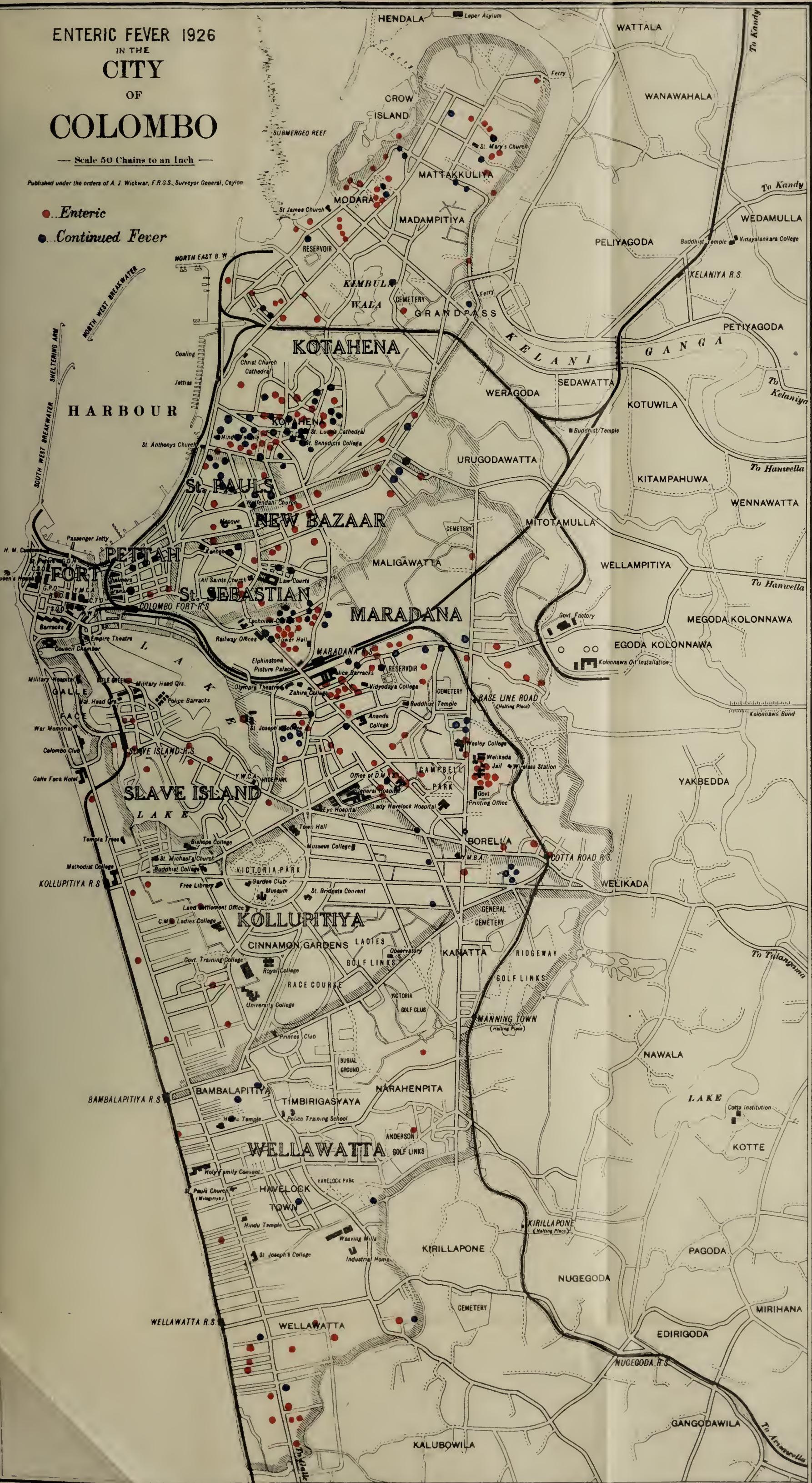
# SPOT MAP N° II

— Scale 50 Chains to an Inch —

Published under the orders of A. J. Wickwar, F.R.G.S., Surveyor General, Ceylon

• Enteric

● *Continued Fever*



MAP OF PORT COQUITLAM

1:100,000 Scale 1956

CITY

COLWOOD

Map No. 1000

Scale 1:100,000

10 Miles

10 Kilometres

ANNEVILLE

STOKE

ELIASON MINE

ADAMS & CO.

SHAW MINE

OCEAN

ATGAW ALUMINE

10 Miles

10 Kilometres

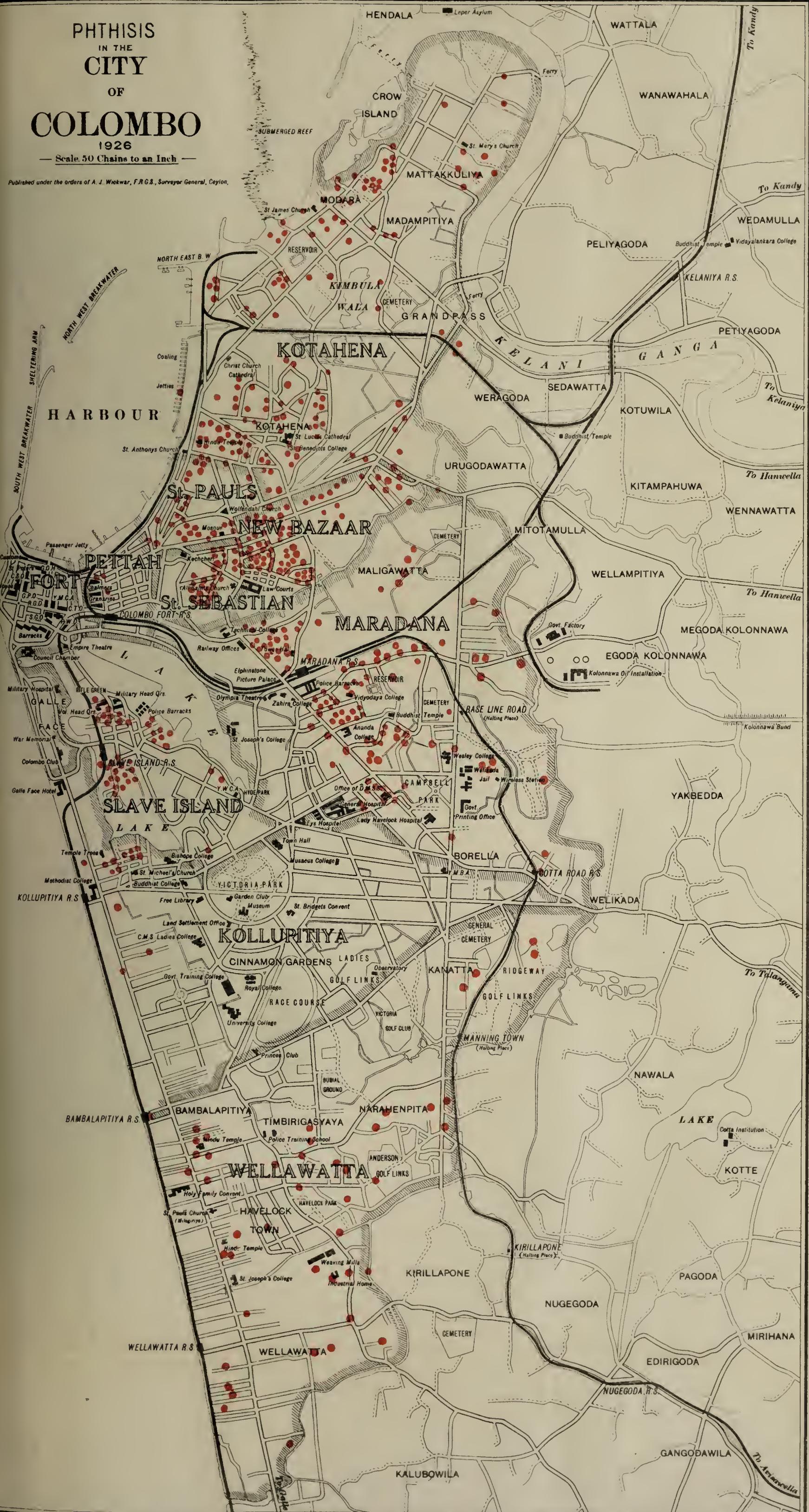
10

# SPOT MAP N° III

## PHTHISIS IN THE CITY OF COLOMBO 1926

— Scale 50 Chains to an Inch —

Published under the orders of A. J. Wickwar, F.R.G.S., Surveyor General, Ceylon.



Sept 9th 1918

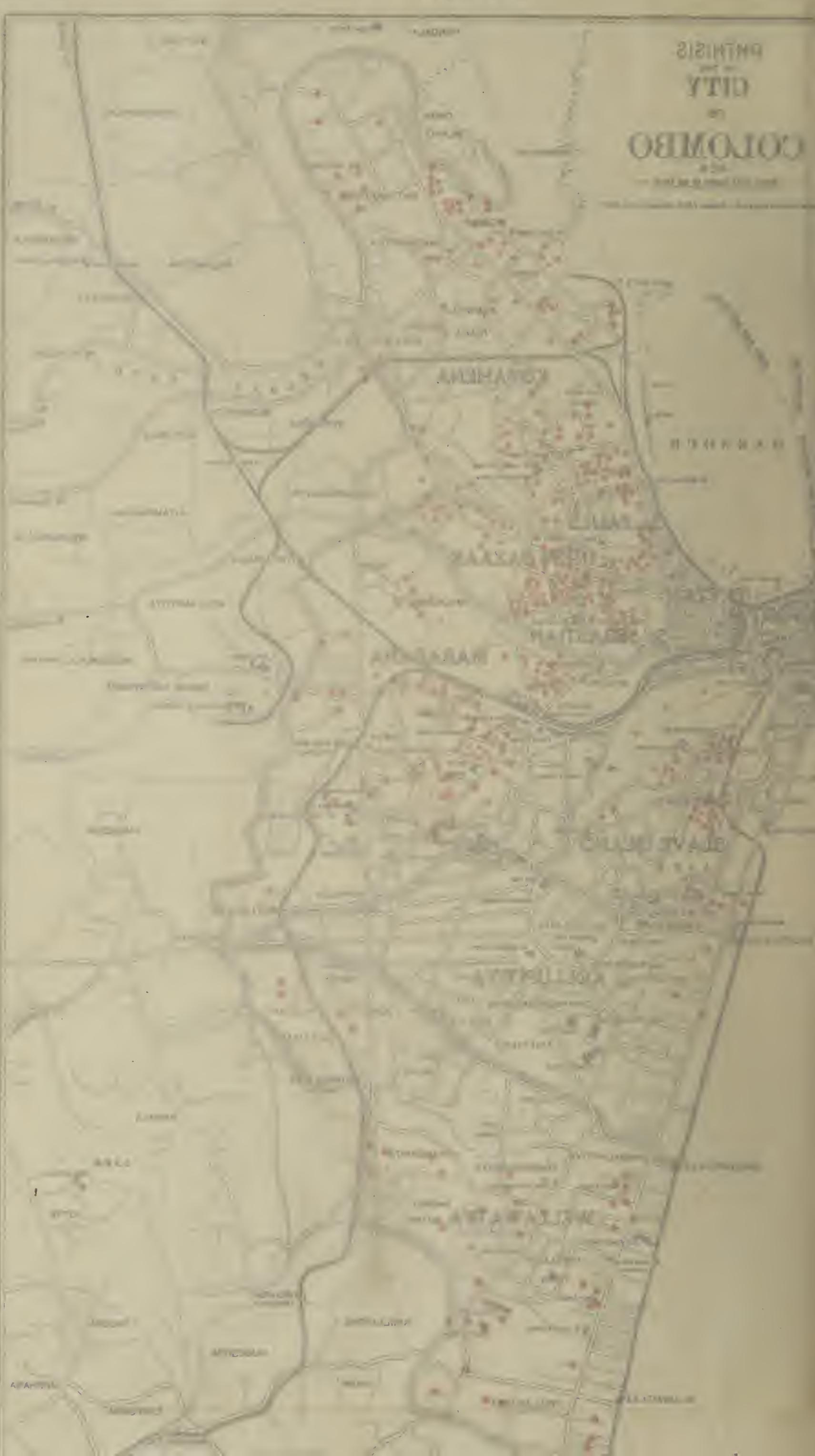
BIRMINGHAM

CITY

COPWELL

— 1918 —

— 1918 —

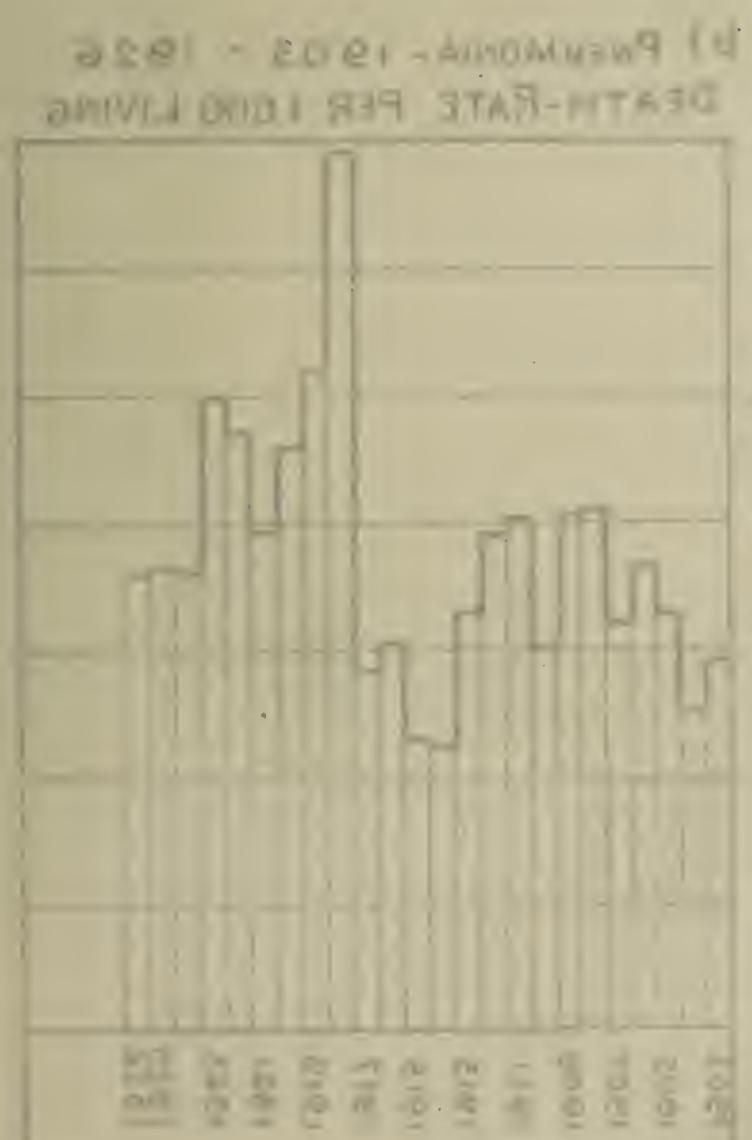


## DIVIDENDS

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DATA FILE NUMBER - 1000

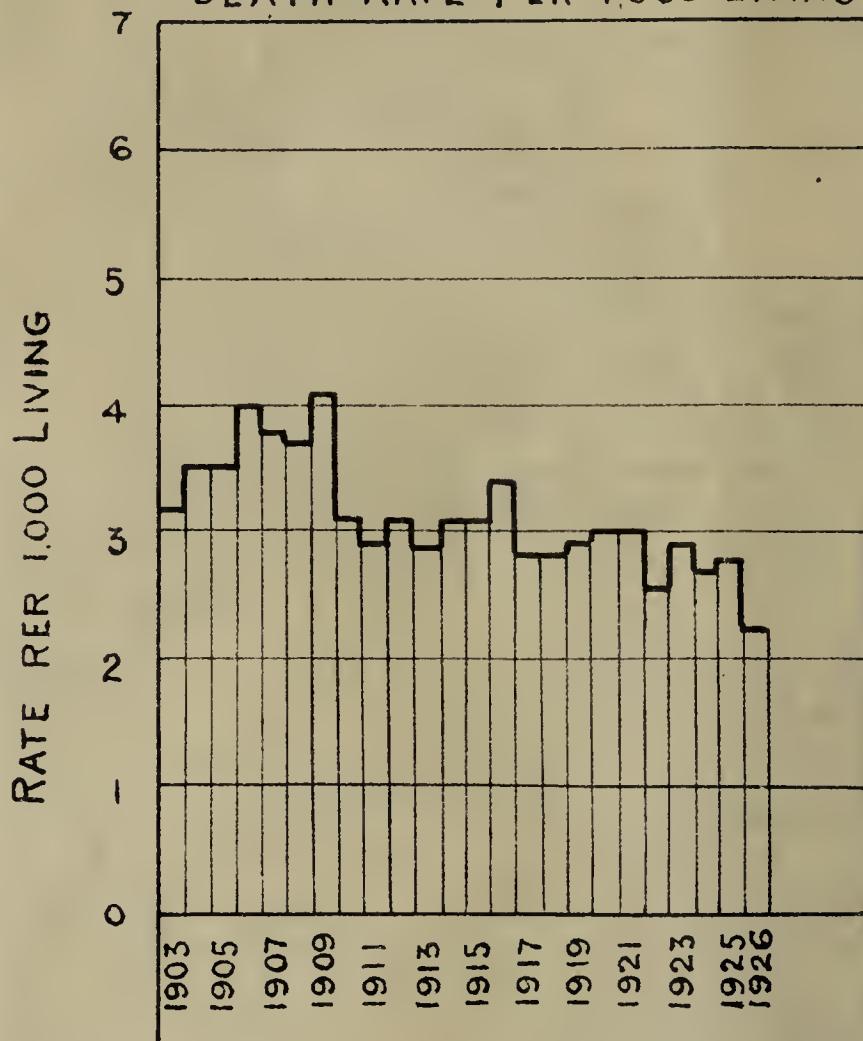


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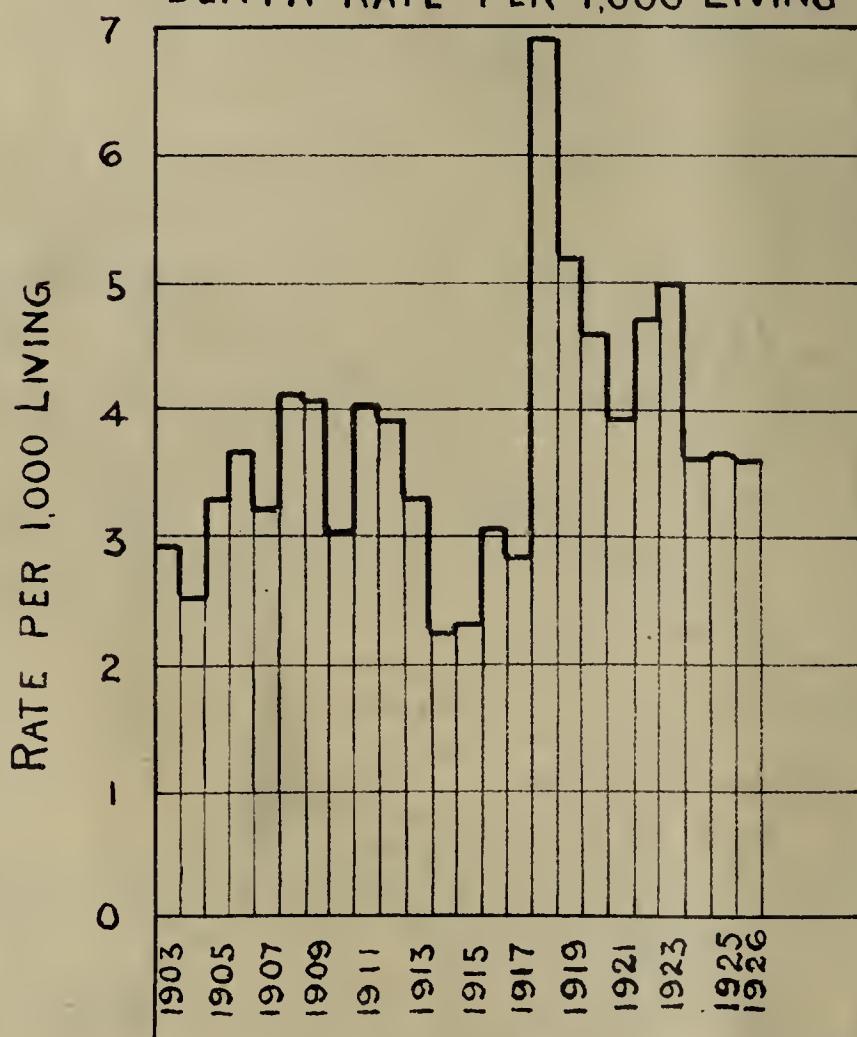


## DIAGRAM NO. VIII

**(a) PHthisis - 1903 - 1926**  
**DEATH RATE PER 1,000 LIVING**



**(b) PNEUMONIA - 1903 - 1926**  
**DEATH-RATE PER 1,000 LIVING**



Europeans than in the case of other races, and that it is chiefly the mild non-fatal types of cases amongst non-Europeans which escape recognition and notification. If diagnosis and notification were as correct and complete amongst non-Europeans as it is amongst Europeans there can be no doubt, as indicated later, that non-Europeans would show a higher instead of a lower rate of infection than the Europeans. It should not be inferred from this, however, that the Europeans here enjoy any greater *natural* immunity to enteric than do the non-Europeans. On the contrary experience shows that Europeans, especially new comers, and those recently returned from long leave in Europe, *i.e.*, during the re-acclimatization period, are very susceptible to enteric. They owe their relative freedom from this disease partly to the fact that they take greater advantage of the protection afforded by preventive inoculation, and partly to the fact that they live under more sanitary conditions than any other race here.

It will be seen (Statement 40) that the fatality amongst European *town cases* during the 10 years 1916–1925 averaged only 15·5 per cent., whereas amongst cases brought from outside districts it was 26·3 per cent., and amongst cases landed from ships in the harbour it was 27·1 per cent. The higher fatality amongst extra-urban and ship cases is a striking indication of the disturbance and consequent harm involved in transporting persons in ship's boats, trains, and other *unsuitable* conveyances, while suffering from this disease. No doubt also many cases brought from outside districts are sent into the Colombo hospitals because they are of a severe type and are not doing well in their homes.

It will be observed (Statement 36) that the fatality amongst all races as well as amongst Europeans during 1926 closely corresponds to the average during the previous 10 years.

To revert briefly to the fatality amongst "all races" (Statement 36) there can be no doubt that a fatality averaging 38·6 per cent. is a clear indication of defective diagnosis and the consequent omission from the returns of many mild non-fatal cases. The actual fatality, were all cases reported, would it is believed be found to be less than half of the recorded fatality, *i.e.*, instead of averaging 38·6 per cent. it would probably be not more than 15 or 16 per cent., and certainly not more than 18 per cent. That being so it follows that at least half of the actual total number of cases escape recognition and notification. The inclusion of these missed cases in the returns would, therefore, raise the case-rate of "all races" (Statement 38) from the recorded 1·84 per 1,000 to at least 3·68 per 1,000 and probably higher.

From this one may conclude that the indigenous races, as a whole, suffer quite as much, indeed more than do Europeans from enteric fever, which is what one would expect in view of their customs and the conditions under which they live.

There are many other interesting points in connection with enteric fever in Colombo, but time, unfortunately, does not permit of further investigation and discussion of the statistics in this Report.

#### XVIII.—CONTINUED FEVER.

Under this heading are included cases of "simple continued fever of not less than seven days duration," such cases having been made compulsorily notifiable in Colombo in 1903, owing to the discovery that many of them were in reality cases of enteric fever, and were responsible for dissemination of that infection.

During the year 1926, 190 cases, including 168 town cases, were recorded, as against 282 cases, including 243 town cases, in 1925. There has thus, as in the case of enteric, been a marked improvement in 1926.

#### XIX.—TUBERCULOSIS.

(See Items 28 to 35 in Statement 12.)

The writer is indebted to the Colonial Advisory Medical and Sanitary Committee for pointing out that in the 1925 Report the majority of deaths due to pulmonary tuberculosis have been erroneously tabulated under the heading of "Acute Pulmonary Tuberculosis." This is an unfortunate clerical error which has appeared in several previous reports, but which has been rectified in the present report.

"Acute pulmonary tuberculosis" is comparatively rarely reported here, and does not, as a matter of fact, appear to be at all common. Deaths from pulmonary tuberculosis are generally certified merely as "phthisis" or "consumption," the great majority of which are without doubt cases of "chronic pulmonary tuberculosis".

#### Pulmonary Tuberculosis. (*Phthisis, Consumption.*)

During the year 1926, 1,355 cases of "phthisis" were reported, of which, however, only 977 were town cases, while 364 were admissions to hospitals from extra-urban districts, and 14 were from ships in the harbour. The corresponding figures for the previous year were 1,146 town cases, 273 extra-urban cases, and 10 cases from ships. In contrasting the 1926 with the 1925 figures it is necessary to mention that the Lunatic Asylum, in which 29 cases occurred in 1925, was transferred early in 1926 from the town to Angoda, an extra-urban district. Even so, however, after making due allowance for Asylum cases, there was a marked improvement in 1926. As Spot Map III. shows, phthisis occurs chiefly in the densely crowded "slum areas" which are occupied for the most part by the poorest and most ignorant of the labouring classes, *e.g.*, Wekanda, Java lane, Maligakanda, Piachaud's lane, Kehelwatta, New Bazaar, Jampettah, and Rajamalwatta.

The almost entire absence of this disease from the high-class residential quarter of Cinnamon Gardens is a very striking illustration of the benefits of living under modern sanitary conditions.

The following statements show the details in regard to the incidence of phthisis in Colombo :—

(42) *Phthisis Mortality per 1,000 Living, 1903 to 1926.*

Year.	Death-rate.	Year.	Death-rate.	Year	Death-rate.	Year.	Death-rate.
1903	3·18	1910	3·13	1917	2·84	1924	2·69
1904	3·51	1911	2·96	1918	2·86	1925	2·81
1905	3·56	1912	3·14	1919	2·95		
1906	4·06	1913	2·88	1920	3·02	Average,	
1907	3·79	1914	3·12	1921	3·02	1903–1925	3·19
1908	3·70	1915	3·16	1922	2·58		
1909	4·13	1916	3·42	1923	2·90	1926	2·27

(43) *Phthisis Death-rates per 1,000 Population of the Indigenous Races, 1921 to 1926.*

Race.	Males.						Females.						Both Sexes.	
	1921.	1922.	1923.	1924.	1925.	1926.	1921.	1922.	1923.	1924.	1925.	1926.	No. of Deaths, 1926.	Death-rate, 1926.
Europeans ...	—	—	—	—	—	—	—	—	—	—	—	—	2	0.665
Burghers ...	2.35	2.49	2.01	1.66	2.36	1.17	1.31	2.09	1.83	1.83	2.75	1.11	18	1.14
Sinhalese ...	3.35	2.61	2.93	2.88	3.06	2.88	4.08	3.53	3.74	3.55	3.55	3.02	358	2.95
Tamils ...	—	—	—	—	—	—	—	—	—	—	—	—	98	1.71
Moors ...	1.80	1.64	1.68	2.00	2.28	1.51	4.02	3.41	5.45	4.50	4.91	2.51	79	1.88
Malays ...	2.54	2.90	4.20	3.23	2.26	2.13	6.55	5.44	5.09	5.45	2.91	3.43	17	2.74
Others ...	2.53	2.00	2.37	2.28	2.52	0.93	3.79	3.60	3.94	3.60	3.62	3.56	15	1.16
All Races ...	—	—	—	—	—	—	—	—	—	—	—	—	587	2.27

The history of the mortality from phthisis during the last 25 years is depicted in Diagram VIII., from which it will be seen that after steadily increasing to a maximum in 1909, it then dropped suddenly and has since then shown a slight but progressive tendency to decline, the lowest mortality recorded during the period being in the year under review. For a full account of the measures adopted with a view of preventing the spread of this disease, reference is requested to Section IX. of the Report for the year 1917, but the following may be briefly mentioned here:—

1907.—Work of improving ventilation and lighting of insanitary tenements commenced in July and since continued.

1909.—Systematic disinfection of all phthisis infected houses begun in July. A marked drop in mortality was observed during the last quarter of the year.

1910.—Phthisis made compulsorily notifiable in August, following which domiciliary visitation, &c., of all cases reported was initiated. Spitting in public conveyances was prohibited by by-law in November.

1914.—Evacuation and closure pending improvement of houses condemned as unfit for human habitation. This action was rendered possible by the advent, in January, 1914, of plague, which automatically brought the plague regulations into force.

1916.—Establishment of Anti-Tuberculosis Institute in October.

1917.—Establishment of the hospital at Ragama for advanced cases of phthisis.

1926.—The removal of the Lunatic Asylum from the town to Angoda which relieved the Colombo statistics of a probable 25 to 30 cases per annum. Even including such of these as may have proved fatal during the year, the mortality in 1926 would still be the lowest on record during the last 25 years.

## XX.—INFLUENZA.

This is not a notifiable disease, and one can, therefore, judge of its prevalence only by the death returns and by the returns of cases treated at the Municipal Dispensaries.

As regards deaths, there were 307 recorded in 1926, as against 269 in 1925, thus indicating a slight increase, but the number of cases treated at the dispensaries showed on the contrary a decrease of 1,527 cases, viz., from 6,384 cases in 1925 to 4,857 cases in 1926.

The charts kept in this office show that the very abrupt wave of this disease which occurred in May-June of 1925 was not repeated in 1926, but that there was nevertheless a clearly marked and sustained although not very great increase of prevalence from May till November, which without doubt affected the general death-rate and helped to maintain it at an unduly high level during that period (see Diagram III.).

(44) *Influenza Cases reported from Municipal Dispensaries during each Month of the Year 1926.*

Month.	Slave Island.	St. Paul's.	Maradana.	Mutwal.	New Bazaar.	Total.
January	... 154	... 120	... 150	... 49	—	473
February	... 64	... 91	... 93	... 30	—	278
March	... 19	... 100	... 95	... 40	—	254
April	... 13	... 95	... 84	... 41	7	240
May	... 35	... 124	... 108	... 39	23	329
June	... 100	... 145	... 142	... 60	22	469
July	... 229	... 173	... 29	46	62	539
August	... 259	... 129	... 85	51	51	575
September	... 175	... 85	120	45	46	471
October	... 191	... 101	94	52	41	479
November	... 127	... 107	109	65	50	458
December	... 19	... 159	66	39	9	292
Total	... 1,385	1,429	1,175	557	311	4,857

## XXI.—PNEUMONIA.

This, which is one of the least susceptible of all diseases to present day sanitary measures, continued during 1926, as previously, to exact a heavy toll (*vidè* Diagram VIII. and the statement below). Until an effective preventive vaccine or curative serum is discovered and generally adopted there appears to be little hope of achieving any material improvement as regards the mortality from this disease, which is chiefly responsible for maintaining the Colombo death-rate at its present level. The enormous damage done by this disease in Colombo during and since the advent of influenza in 1918 is well shown in the diagram.

## (45) Deaths from Pneumonia and the Death-rates, 1926, by Race.

Race.		No. of Deaths.		Death-rate per 1,000 Population.
All Races	...	926	...	3.58
Europeans	...	6	...	2.00
Burghers	...	32	...	2.03
Sinhalese	...	523	...	4.30
Tamils	...	160	...	2.79
Moors	...	117	...	2.78
Malays	...	19	...	3.06
Others	...	69	...	5.35

## XXII.—DENGUE.

Manson has pointed out that a study of epidemics of dengue seems to indicate that this disease has a tendency to break out in pandemic form about once in 20 years.

There was a very severe outbreak in Colombo in 1906, and again in 1926; but whether other countries suffered simultaneously is not known here.

The Medical Department Research Board of the United States Army claim that the work recently carried out by them definitely excludes the culex mosquito as a carrier of dengue, and with equal conclusiveness convicts the Aedes aegypti (Stegomyia faciata) as the spreader of this disease. In view of this finding it may be of interest to mention the following:—The Aedes aegypti, or as it commonly called the Stegomyia faciata, is extremely prevalent in Colombo. It is a day biter, but may occasionally bite at night in well lighted rooms. The popular idea that it is risky to visit during the day persons suffering from dengue is therefore correct, for a mosquito may live six weeks or even longer, and probably remains infective for the whole of its life. The blood of a person infected with dengue is infective to the mosquito for a few hours before the appearance of symptoms and during the first three days of the disease, hence the difficulty of controlling the spread of this disease so long as the proper kind of mosquito is about. A mosquito cannot transmit the infection until the eleventh day after it has itself been infected by feeding upon an infected person.

## Dengue in Colombo in 1926.

Although sporadic cases of dengue occurred at intervals throughout the year it was not, as the statement below shows, until the end of October that, according to the Municipal Dispensary returns, it began to increase, the maximum prevalence being experienced in December. The outbreak in 1926 did not, according to the writer's recollection, approach in the matter of prevalence the outbreak in 1906, which at one time threatened to become a serious embarrassment in the carrying on of commerce.

## (46) Dengue Fever treated at the Municipal Free Dispensaries during the Year 1926.

## Statement showing Incidence by Months.

Month.	Slave Island.	St. Paul's.	Maradana.	Mutwal.	New Bazaar.	Total.
January	...	—	...	1	...	...
February	...	—	...	...	...	—
March	...	—	—	...	...	—
April	...	—	...	1	...	—
May	...	—	...	5	...	—
June	...	—	—	1	...	—
July	...	—	—	—	...	—
August	...	—	—	4	...	—
September	...	—	—	—	...	—
October	...	10	...	3	...	2
November	...	135	...	16	...	65
December	...	124	...	62	...	80
	Total	269	93	147	111	83
		—	—	—	—	703

## Part II.—Administration.

## XXIII.—EXPENDITURE.

## Expenditure in 1926.

Head of Expenditure	Estimated Expenditure. Rs. c.	Actual Expenditure. Rs. c.	Saving.	
			Rs.	c.
Higher Staff	... 61,320 0	... 59,537 40	...	1,782 60
Clerical Staff	... 19,608 0	... 17,787 40	...	1,820 60
Sanitary Branch	... 203,194 0	... 164,317 38	...	38,876 62*
Child Welfare	... 47,950 0	... 40,427 3	...	7,522 97
Dispensaries	... 68,390 0	... 61,821 8	...	6,568 92†
Markets	... 34,046 0	... 32,887 74	...	1,158 26
Cemeteries	... 23,716 0	... 22,421 87	...	1,294 13
Laboratory	... 32,415 0	... 30,536 52	...	1,878 48
Laundries	... 2,211 0	... 2,063 46	...	147 54
Total	... 492,850 0	... 431,799 88	...	61,050 12

\* The saving on the Sanitary Branch estimate was due chiefly to reduced expenditure on (a) Plague, reduction Rs. 24,150.57; (b) Prevention of Infectious Diseases, reduction Rs. 4,830.69; (c) Uniforms, reduction Rs. 1,478.85.

† The saving on Dispensaries estimate was due chiefly to reduced cost of drugs, as the result of importing drugs from England instead of purchasing locally, which effected a saving of Rs. 5,529.06.

## XXIV.—NEW WORKS, IMPROVEMENTS, &amp;C.

(a) *Laundries.*

*Blomendahl*—(1) Twenty-five large and twelve small concrete posts were erected for the drying up of clothes.

(2) The usual cementwashing, painting, and minor repairs were done.

*Wekanda*—(1) Twenty-nine tanks smooth plastered with cement and one tank lined experimentally with white glazed tiles.

(2) Boundary extended at Lake side.

(3) Clean linen single rooms Nos. 9 to 12 converted into two double rooms.

(4) Soiled linen single rooms Nos. 8 and 9 converted into two double rooms.

(5) All the 30 soiled linen rooms rat-proofed with wire netting.

(6) All the 30 soiled linen rooms plastered with cement.

(7) Half of the ground opposite the clean linen rooms levelled and gravelled.

(8) All the leaking rooms repaired.

(9) All 30 rooms, lavatory, and drying linen rooms cementwashed, and caretaker's quarters whitewashed.

(10) Woodwork of all rooms and caretaker's quarters painted.

(b) *Cemeteries.*

*Kanatta*—(1) The flooring of the old cooly lines, compound, and kitchen was cemented.

(2) A set of new type water hydrants was fixed along the main road of the cemetery.

(3) Minor repairs and improvements to the roof of the assistant cemetery-keeper's bungalow.

(4) A new and up-to-date plan of the cemetery was made.

(5) 125 hoop iron flower pot stands were placed inside the main gate.

*Liveramentu*—(1) One new store room built.

(2) One additional cooly lines constructed.

(3) One bath room for coolies built.

(4) Earth steps were replaced by 18 blocks of concrete steps leading to the terraces.

(5) Sixty feet of broken wall rebuilt.

(6) Seven acres of jungle cleared.

(7) 300 yards of hedge planted.

(8) 200 yards of path made.

(9) 200 yards borders made and planted with ornamental plants.

*Madampitiya*—(1) Iron bars fixed to windows and ventilation of cooly lines improved.

(2) Bathing place for coolies constructed.

(c) *Markets.*

*Edinburgh*—A new water tap was fixed.

*St. John's*—Repairs, painting, and whitewashing done.

*Kotahena*—(1) Three new cane tats were fitted at the three main gates.

(2) Broken glass fixed on top of the gala wall.

*Borella*—Recess facing Kanatta road fenced off.

*Slave Island*—(1) Movable shutters fixed in the fish section in place of fixed ventilators.

(2) Market whitewashed.

*Dean's Road*—(1) Ceiling of the ice room repaired.

(2) Tats fixed at the three vegetable markets.

*Gintupitiya*—(1) Five new gas lamps provided in place of four old lamps.

(2) Broken floor and walls of stalls repaired and cemented.

(3) A large skylight provided in store room.

(4) Six cement block supports to planking in front of stalls.

(d) *Equipment.*

(1) "Eclair" knapsack spraying and limewashing machine was purchased at a cost of Rs. 90'55.

(2) "Four Oaks" dust sprayer was imported at a cost of Rs. 82'32.

(3) Three motion pictures (health series) were purchased from America for Rs. 835'62.

## XXV.—(a) GENERAL SANITATION.

Statement 47 gives a summary of the work done by the Outdoor Staff, exclusive of the work by the Inspector of Insanitary Dwellings.

The number of sanitary inspections which rose from 74,336 in 1924 to 83,764 in 1925 showed a still further increase to 91,385 in 1926.

These frequent inspections are of value not only as a means of detecting and rectifying insanitary conditions, but also because they keep the staff in close touch with the people and have a highly educative value, every Inspector being trained to explain to the people the dangers associated with infectious diseases, lack of light and ventilation in the home, &c.

Owing to the greatly lessened prevalence of enteric and plague, and other infectious diseases, there was a marked reduction in the number of premises which required disinfection and disinfestation. Nevertheless, in the course of the intensive campaign carried on against rats and fleas throughout the year, 5,809 dwellings were pesterined and 12,040 were claytonized and partially unroofed, while 18,422 rat holes were located, fumigated, and sealed up.

A pleasing feature in the statement below is the reduction in the number of prosecutions which it was found necessary to enter, from 2,784 in 1925 to 2,569 in 1926.

## (47) Work done by Sanitary Staff during the Year 1926. (Exclusive of Work done by the Inspector of Insanitary Buildings.)

Nature of Work.	Fort.	Pettah.	San Sebastian.	St. Paul's.	Kota-hena.	Mut-wul.	New Bazaar.	Mara-dana North.	Mara-dana South.	Slave Island.	Kollupitiya.	Cinnamon mon Gardens.	Bambalapitiya.	Timbirigasyaya.	Wellawatta.	Total.		
1. Number of inspections ...	5,592	4,357	5,635	5,936	5,276	8,700	7,128	6,015	5,765	4,599	6,577	4,735	4,164	4,467	5,758	6,661	91,385	
2. Number of premises where sanitary defects were found : (a) non-structural ...	69	193	299	310	253	195	208	596	400	226	366	161	111	116	86	164	3,753	
3. Number of premises where sanitary defects were found : (b) structural ...	17	90	65	130	124	106	115	86	204	205	122	63	34	82	13	25	1,431	
4. Number of premises where non-structural defects were rectified ...	73	99	149	215	149	138	135	509	130	206	216	79	110	37	51	65	2,711	
5. Number of premises where minor structural defects were rectified.	13	50	69	99	128	58	84	43	64	158	34	24	26	27	13	16	906	
6. Number of buildings, other than dwellings, structurally improved.	6	40	31	45	13	3	29	53	59	16	52	—	—	—	11	11	358	
7. Number of insanitary dwellings closed under Plague Regulations	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8. Number of insanitary dwellings remaining closed under Plague Regulations at end of year (total)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36	
9. Number of insanitary dwellings demolished under Plague Regulations	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10. Number of insanitary premises scavenged by Public Health Department Cleansing Gang ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
11. Number of dwellings pesterined ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
12. Number of dwellings claytonized ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
13. Number of dwellings unroofed ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
14. Number of rat-holes found, claytonized, and filled up	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
15. Number of dwellings disinfected ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
16. Number of dwellings limewashed ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
17. Number of wells filled up ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
18. Number of cesspits filled up ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
19. Number of notices served under section 1, sub-section (1), of Ordinance No. 15 of 1862. (Filthy premises)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
20. Number of notices served under section 190 of Ordinance No. 6 of 1910. (Privy accommodation)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
21. Number of notices served under section 180 of Ordinance No. 6 of 1910. (Filling up stagnant pools, &c.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
22. Number of notices served under section 178 of Ordinance No. 6 of 1910. (Cleansing and limewashing)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
23. Number of notices served under section 49, Part I., of Plague Regulations. (Closure of buildings unfit for human habitation)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
24. Number of notices served under by-law 8 (1), chapter 22, Plague Regulations. (Improvement to buildings unfit for human habitation)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
25. Number of notices served under section 38, Part I., of Plague Regulations. (Filling up wells)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
26. Number of notices served under section 39, Part I., of Plague Regulations. (Overcrowding)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
27. Number of milk samples taken under Rule 5, chapter 14, By-laws	72	74	74	75	72	72	72	71	73	73	72	73	72	73	72	72	71	1,160
28. Number of prosecutions ...	38	165	289	212	142	157	134	323	152	132	114	87	70	58	69	69	2,569	
29. Number of convictions*	37	148	274	203	140	125	311	387	143	125	102	80	70	55	69	69	2,407	
30. Number of cases acquitted, withdrawn, or otherwise dealt with ...	—	16	13	6	3	14	21	8	11	9	11	9	3	2	2	2	132	
31. Number of cases pending at end of year ...	—	1	1	3	3	11	3	2	17	1	1	1	1	1	1	1	52	
32. Amount of fines ...	... 874,001,746·50	... 1,986,002,140·00	... 1,164,003,856·00	... 734,501,164·00	... 1,164,001,594·00	... 4,755,001,411·00	... 1,086·00	... 980·00	... 410,000	... 603,000	... 911,000	... 603,000	... 911,000	... 603,000	... 911,000	... 25,387·00		

\* Includes convictions obtained during 1926 on cases pending from previous year.

## (48) Statement of Prosecutions and Convictions during the Year 1926.

Ordinance or By-law.	Offence.	No. of Prosecutions during 1926.	*No. of Convictions obtained during 1926.
Section 1, sub-section (1), of Ordinance No. 15 of 1862 : Filthy premises	... 813	... 782	
Section 1, sub-section (1), of Ordinance No. 15 of 1862 : Filthy cattle shed	... 3	... 3	
Section 1, sub-section (1), of Ordinance No. 15 of 1862 : Filthy dairy	... 50	... 48	
Section 1, sub-section (1), of Ordinance No. 15 of 1862 : Filthy laundry	... 4	... 3	
Section 1, sub-section (4), of Ordinance No. 15 of 1862: Nuisance by cattle, swine, &c.	91	... 88	
Section 1, sub-section (9), of Ordinance No. 15 of 1862: Selling unwholesome food..	14	... 14	
Section 39 of Ordinance No. 1 of 1896: Unlicensed dairy	... 1	... 1	
Section 43 of Ordinance No. 1 of 1898: Storing milk in unauthorized places	... 2	... 2	
Section 53 of Ordinance No. 1 of 1898: Unregistered laundry	... 23	... 19	
By-law made under Section 4 of Ordinance No. 3 of 1897 : Storing rice in unauthorized place	... 37	... 26	
Section 38 of Ordinance No. 3 of 1897 : Failure to close well after notice	... 1	... —	
By-law made under Sections 109 (1) and 110 (5) of Ordinance No. 6 of 1910 : Growing vegetables under insanitary conditions	... 12	... 11	
By-law made under Sections 109 (1) and 110 (5) of Ordinance No. 6 of 1910 : Spitting in public building	... 12	... 12	
Section 178 of Ordinance No. 6 of 1910 : Failure to limewash	... 104	... 93	
Section 180 of Ordinance No. 6 of 1910 : Failure to fill swampy land	... 1	... 2	
Section 190 of Ordinance No. 6 of 1910 : Failure to provide privy accommodation	7	... 6	
Section 184 of Ordinance No. 6 of 1910 : Committing nuisance	... 11	... 13	
Section 205 of Ordinance No. 6 of 1910 : Failure to report infectious disease	... 23	... 22	
Section 212 of Ordinance No. 6 of 1910 : Unlicensed offensive trades	... 4	... 3	
Rule 29, chapter VIII., by-laws : Digging pits and wells without permission	... 12	... 10	
Rule 31, chapter VIII., by-laws : Failure to properly dispose of rubbish	... 2	... 1	
Rule 32, chapter VIII., by-laws : Dumping rubbish without permission	... 1	... 1	
Rule 33, chapter VIII., by-laws : Removing rubbish without permission	... 2	... 2	
Rule 4, chapter IX., by-laws : Filthy bathing place	... 6	... 6	
Rule 1, chapter XI., by-laws : Unlicensed eating-house	... 96	... 81	
Rule 1, chapter XI., by-laws : Unlicensed bakery	... 2	... 2	
Rule 7, chapter XI., by-laws : Filthy eating-house	... 113	... 107	
Rule 7, chapter XI., by-laws : Filthy bakery	... 29	... 27	
Rule 8, chapter XI., by-laws : Unclean workmen in bakery	... 17	... 18	
Rule 2, chapter XIII., by-laws : Obstructing the market-keeper in his duties	... 1	... 1	
Rule 3, chapter XIII., by-laws : Disorderly conduct in public market	... 67	... 57	
Rule 9, chapter XIII., by-laws : Selling fish or meat without license	... 4	... 4	
Rule 10, chapter XIII., by-laws : Filthy private stall	... 18	... 14	
Rule 20, chapter XIII., by-laws : Unregistered servant in stall	... 1	... —	
Rule 28, chapter XIII., by-laws : Throwing rubbish in market	... 9	... 8	
Rule 29, chapter XIII., by-laws : Filthy market stall	... 49	... 49	
Rule 31, chapter XIII., by-laws : Failure to serve public in stall...	... 5	... 5	
Rule 34, chapter XIII., by-laws : Obstruction of passages in public markets	... 208	... 197	
Rule 39, chapter XIII., by-laws : Keeping cattle in excess of number allowed	... 29	... 29	
Rule 2A, chapter XIV., by-laws : Exposing food to dust and flies	... 393	... 367	
Rule 3, chapter XIV., by-laws : Sale of adulterated milk	... 132	... 124	
Rule 5, chapter XIV., by-laws : Refusing Sanitary Inspector sample of milk	... 3	... 2	
Rule 7, chapter XIV., by-laws : Unlicensed milk vendor	... 157	... 147	
Total	... 2,569	2,407	

\* Includes convictions obtained during the year 1926 on prosecutions instituted during the previous year.

## (49) Registered Trades during the Year 1926.

	Number on Register at end of the previous Year.	Number discontinued during the Year under review.	New Registrations during the Year.	Total on Register end of the Year.
Dairies	... 56*	... 8	... 8†	... 56
Bakeries	... 54	... 3	... 4	... 55
Laundries	... 267	... 16	... 33	... 284
Eating-houses	... 512	... 148	... 155	... 519
Aerated water factories	12	—	—	... 12
Opium divans	—	—	—	—

\* The total given as 55 in the 1925 Report was an error.

† Includes re-registration under new names of two of the old dairies recorded as discontinued.  
Thus only six new dairy premises were established.

## (50) Cesspits in Colombo.

	At end of previous Year.	Number filled up during 1926.	Number remaining at end of 1926.
San Sebastian	... 105	2	... 103
St. Paul's	... 32	—	... 32
Kotahena	... 1	—	... 1
New Bazaar	... 1	1	... —
Total	... 139	3	136

*Food Inspection.*

Much to the writer's regret, it is still necessary to have to record that no special staff for the carrying out of the important work of food inspection in Colombo has been sanctioned by the Council; consequently food inspection has had to be carried out spasmodically, as hitherto, by the Sanitary Inspectors in addition to their other multifarious duties.

Special attention was, as usual, directed to the inspection of bakeries, dairies, eating-houses, and public markets, a record of which is given in Statement 51.

(51) *Food Trades Inspections during the Year 1926. Number of Inspections made.*

Ward.	Bakeries.	Dairies.	Eating-houses.	Public Markets.
Fort ...	46	—	693	—
Pettah ...	221	—	784	76
San Sebastian ...	86	—	551	378
St. Paul's ...	187	673	626	95
Kotahena ...	188	195	222	94
Mutwal ...	155	166	122	100
New Bazaar ...	192	270	181	—
Maradana North ...	85	191	196	—
Maradana South ...	91	47	433	114
Dematagoda ...	133	56	536	—
Slave Island ...	198	124	540	181
Kollupitiya ...	131	264	176	112
Cinnamon Gardens ...	55	340	249	213
Bambalapitiya ...	203	358	194	166
Timbirigasyaya ...	—	221	243	—
Wellawatta ...	114	237	315	—
Total ...	2,085	3,142	6,061	1,529

Compared with the previous year it will be seen that there has been a very great increase of activity in the matter of inspection of these important food trades. Thus bakeries inspections increased from 1,597 to 2,085, dairies from 1,971 to 3,142, eating-houses from 3,637 to 6,061, and public markets from 985 to 1,529. In the case of bakeries and dairies, in order to facilitate supervision by the higher staff, an inspection record sheet is kept on each premises, in a glazed frame hung up upon the wall, and every visit paid by a Sanitary Inspector has to be entered thereon, with date and initials of the Inspector. These sheets are examined and verified from time to time by the higher staff, and once a quarter are brought to the head office for purposes of record, new sheets being then issued.

(52) *Foodstuffs condemned during the Year 1926.*(a) *In the Town.*

Rice	...	...	...	1,212 bushels and 3 measures.
Flour	...	...	...	6½ bags and 410 lb.
Potatoes	...	...	...	73 bags and 23,057 lb.
Apples	...	...	...	15 cases.
Grapes	...	...	...	435 barrels.
Dhall	...	...	...	1 bushel and 1,898 lb.
Onions	...	...	...	1,750 lb.
Meat	...	...	...	305¾ lb.
Fish	...	...	...	10 oz.

(b) *At the Customs.*

Sardines	...	...	...	14 cases.
Dry fish	...	...	...	2 bundles.

(c) *At Chalmers Granaries.*

Rice	...	...	...	907 bushels and 18 measures.
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(d) *At Kochchikade Warehouse.*

Potatoes	...	...	...	197 bags.
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## XXVI.—DAIRIES AND MILK SUPPLY.

During the year 1926 the registration of 8 dairies was cancelled and 8 new registrations were granted. These figures include 2 registered dairies which changed ownership during the year, so that only 6 new dairies were established including 1 where the dried constituents of milk are imported from New Zealand and "reassembled" at a factory in Colombo.

The cattle shed licenses issued during 1926 in respect of dairies, provided for the keeping of 1,752 milch cattle, including buffaloes, representing an increase of 159 milch cattle compared with the previous year. This is a welcome increase, for the milk supply of the town is far short of what is required for the population, and it is essential that any augmentation of the supply should be derived from dairies which are under sanitary supervision and not from itinerant unregistered dairymen who, as a class, have been proved to resort to the most gross and dangerous adulteration.

As mentioned earlier in this Report, no fewer than 3,142 inspections of the 56 registered dairies were carried out by the Sanitary Inspectors during the year, as compared with 1,971 inspections during the previous year. This is in accordance with a standing departmental order that every dairy must be visited at least once a week throughout the year. The result of these frequent inspections was that 33 of the 56 dairies were involved in prosecutions ending in 132 convictions for various offences as detailed in the statement below. One dairyman was convicted no less than 15 times, viz., 9 times for adulteration, 5 times for filthy premises, and once for storing milk improperly. The next worst record was 11 convictions, 6 of which were for adulteration, 4 for filthy premises, and 1 for overcrowding of cattle.

(53) *Town Dairies. Number of Convictions in 1926.*

	No. of Convictions.
Adulteration of Milk	53
Excess Cattle	29
Filthy Dairy	48
Storing Milk in unauthorized place	2
Total number of convictions	<u>132</u>

*Quality of the Milk Supply.*

Prior to 1904 no systematic investigation of the quality of the milk produced by the dairy cattle in Colombo had been carried out, and consequently there was no standard whereby samples exposed for sale could be judged and action taken. It was, therefore, decided to carry out a series of tests, a special Inspector being appointed for the purpose. Over 1,000 samples were thus taken in 1904-1905, including about 500 samples of cows milk and 500 of buffalo milk. Each sample was drawn in the presence of the Inspector, due precautions being taken to ensure cleanliness and complete stripping of the udder. Both morning and evening milkings were taken, and the samples thus obtained were conveyed direct to the City Analyst by the Inspector. As the result of this investigation the City Analyst (the late Mr. Kelway Bamber) recommended the adoption of the following standard, viz. :—

	Cow.	Buffalo.
Total Solids	12·0	16·0
Fat	3·5	7·0
Solids not Fat	8·5	9·0

The Municipal Council in due course approved of this standard, which was accordingly adopted by the Public Health Department pending confirmation by legislation. The question of legislation was, however, postponed year after year pending the adoption of a comprehensive Food and Drugs Act which, although drafted by a special committee with the Attorney-General as Chairman and approved, has not up to date received the sanction of Government. The position, therefore, is that for over 20 years the Public Health Department has been working to the provisional standard referred to above.

In view of the fact that the standard has not been made law, coupled with the fact that a certain small proportion of the milch cattle here undoubtedly do at times produce milk which falls slightly below the standard as the result of underfeeding, poor condition, &c., it has long been the practice not to enter prosecution as a rule for degrees of adulteration below 10 per cent. as judged by the provisional standard. This is undoubtedly unsatisfactory, but until a standard has been fixed by law it is inadvisable to depart from this practice.

*Purity of the Milk Supply.*

The City Microbiologist has recorded, as the result of his experience, that the bacteriological purity of the milk supplied by the registered dairies in Colombo compares not unfavourably with milk supplied by good class dairies in England. He has pointed out, on the other hand, that the climatic conditions here are very much in favour of rapid multiplication of bacteria, and it is not, therefore, surprising that very high bacterial counts are liable to be obtained when milk has been kept for some time at ordinary atmospheric temperatures. For this reason it is essential here that milk, if kept, should be artificially cooled, and that it should be consumed as soon as possible after it is drawn. Not only so but, in view of the widespread prevalence of enteric and other infections amongst the indigenous population and the notorious carelessness of servants, the precaution of boiling or pasteurising milk immediately before consumption should never be omitted.

As regards adulteration of milk during 1926, reference is requested to the annexed report by the City Analyst. It will be seen that of 1,163 samples examined, 755 or 65 per cent. passed the provisional standard, 274 or 23·6 per cent. of the samples showed excess of between 1 and 10 per cent. of water, 83 or 7·1 per cent. showed excess of between 11 and 30 per cent. of water, and 51 or 4·4 per cent. showed excess of over 30 per cent. of water.

The following classification of milk samples according to the source of the sample shows the usual significant contrast between milk derived from registered dairies and that from unregistered dairymen. Omitting the low degrees of adulteration amounting to not more than 10 per cent. added water, it will be seen that whereas only 6·5 per cent. of the samples from registered dairies in the town were adulterated, no less than 45·3 per cent. of the samples taken from unregistered milkmen were adulterated.

(54) *Milk Sampling during the Year 1926.*

Statement showing the number of samples adulterated with water up to 10 per cent.  
and above 10 per cent.

Source of Sample.	10 Per Cent. and under.			Above 10 Per Cent.			All Adulterations,	
	Number of Samples	Number adul- taken.	Per Cent.	Number adul- tered.	Per Cent.	Number adul- tered.	Per Cent.	adul- tered.
Town dairies	... 923	... 222	... 24·1	... 60	... 6·5	... 282	... 30·6	
Unregistered vendors	... 150	... 26	... 17·3	... 68	... 45·3	... 94	... 62·7	
Dairies outside Colombo	... 87	... 19	... 21·8	... 4	... 4·6	... 23	... 26·4	
Total	... 1,160	267	23·0	132	11·4	399	34·4	

NOTE.—The City Analyst shows a total of 1,163 samples, of which 408 failed to pass the "provisional standard." His figures, however, include some samples not submitted by the Public Health Department.

The "Provisional Milk Standard," to which the Public Health Department has worked for 20 years is as follows :—

	Cow.	Buffalo.
Total solids	... 12·0	... 16·0
Fat	... 3·5	... 7·0
Solids not fat	... 8·5	... 9·0

The Public Health Department was, as hitherto, much indebted to the Colombo Ladies' League for their valuable assistance in regard to the improvement of the sanitation of dairies and the purity of the milk supply. They provide annually medals, cups, and certificates, for competition amongst the dairymen, and systematically inspect and judge the dairies entered for the competition. The writer has had ample evidence that these competitions have engendered an entirely new and much to be desired keenness amongst the dairymen to keep the sanitary state of their dairies up to as high a standard as possible, and to avoid adulteration of their milk supply, a conviction for which automatically renders them ineligible for awards.

In their reports on dairies for the year 1926, the Ladies' League expressed their pleasure at finding an all round improvement in the condition of the dairies visited.

The following are their chief awards for the year 1926 :—

Challenge Cup ... Won by Mrs. R. Koch, Glenrose Dairy, Havelock road.

## A DIVISION.

Silver Medal ... Won by Mr. C. B. Fernando, Maycliff, Blomendahl road.

## B DIVISION.

Silver Medal ... Won by Mr. Clarence de Vos, Clarenden Dairy, Wellawatta road.

The awards for this and the bakeries competition were presented by Lady Clifford, C.B.E., at a meeting presided over by His Excellency the Governor.

## XXVII.—BAKERIES.

During the year 1926 the registration of 3 bakeries was cancelled and 4 new registrations were granted, leaving a total of 55 bakeries on the register at the end of the year, as against 54 at the end of the previous year. 2,085 inspections were paid to bakeries during the year by the Sanitary Inspectors, as a result of which 46 convictions, as detailed below, were obtained. Twenty-eight bakeries were involved in these convictions.

As in the case of dairies, the Colombo Ladies' League gave us great assistance by offering prizes, and by inspecting and judging such of the bakeries as were entered for the competition. Some idea of the keen interest which these competitions arouse may be gathered from the fact that no fewer than 48 of the total of 55 registered bakeries were entered, with the result that 17 were awarded prizes and certificates, while 10 others, which had earned 75 per cent. and upwards in marks assigned by the League's visitors, had to be disqualified owing to convictions obtained at the instance of the Sanitary Inspectors. While it is regretted that bakeries, which were found by the League's visitors to attain such a high standard as 75 per cent. and upwards, should have been disqualified on account of actions instituted by the officers of the Public Health Department, it is inevitable that this should occur owing to the far more frequent inspections made by the Sanitary Inspectors, who are thus in a better position than the League's visitors to detect occasional lapses from the sanitary rules, such as neglect to keep the bakery clean, or to ensure cleanliness of the workmen's persons and clothing.

The general conclusion of the Ladies' League was that the bakeries appeared to have deteriorated during the year, which is borne out by the increase in the number of convictions for filthy bakery premises during the year as compared with the previous year.

The following are the details of the convictions during 1926.

(55) *Registered Bakeries in Colombo. Number of Convictions, 1926.*

Offence.				No. of Convictions.
Filthy bakery	...	...	...	27
Unclean workmen	...	...	...	18
Failure to obtain license	...	...	...	1
Total number of convictions			...	<u>46</u>

N.B.—28 bakeries were involved in these convictions.

The following are the chief awards by the Ladies' League during 1926 :—

Challenge Cup      ...    Won by P. N. Kapadia of 36, Rifle street.

A DIVISION.

Silver Medal      ...    Won by D. M. Silva of 182, Mutwal street.

B DIVISION.

Gold Medal      ...    Won by W. D. John Singho of 63, Blomendahl road.

BEST BREAD COMPETITION.

A DIVISION.

Silver Medal      ...    Won by P. N. Kapadia of 24, First Cross street.

B DIVISION.

Silver Medal      ...    Won by M. W. D. F. Appuhamy of 47, Barber street.

XXVIII.—EATING-HOUSES.

There were 512 eating-houses on the register at the end of 1925 ; during 1926, 148 were discontinued and 155 new registrations were granted, leaving 519 on the register at the end of the year.

These frequent changes add to the difficulty of supervising these establishments. Special difficulty was experienced during the year in the matter of sanitary control, owing to the very defective powers conferred by the existing by-laws. It was, therefore, decided to amend them, and a revision by the Chairman on the lines of the Local Government Board rules was accordingly adopted by the Council, and has been submitted to Government for sanction.

The questions of the quality of food supplied, and the adequacy of latrine accommodation and drainage of eating-houses were also raised during the year.

It was pointed out in reply that the public who frequent these eating-houses are very critical of the quality of the food supplied to them and would not tolerate the use of decomposed ingredients in their curries, with the result that it is very rare to find food unfit for consumption on such premises. As regards latrine accommodation and drainage, a special report (No. 178 of August 17, 1926,) was submitted in which it was recorded that out of a total of 469 eating-houses then on the register 141 had latrines attached, of which 100 were connected to the sewer and 41 were on the bucket system, while 328 had no latrines, these latter premises being merely roadside establishments the occupants of which resort either to public lavatories or latrines in adjacent premises. It was decided to enforce connection to the sewer of the 41 latrines mentioned as not being so connected, and that, in future, no new eating-house with an attached latrine which could be connected to the sewer should be registered, unless and until connection had been effected. The existing by-laws do not, as a matter of fact, provide for the enforcement of such a condition, but this will be rectified when the revised by-laws come into force.

XXIX.—AERATED WATER FACTORIES.

No change in the matter of registration occurred during the year, the total number of these factories remaining, as in the previous year, at twelve.

XXX.—LAUNDRIES.

There were 267 registered dhobies on the list at the end of 1925 ; during 1926, 16 of these were cancelled and 33 new registrations were granted, leaving a total of 284 on the register at the end of the year.

In addition to these there are two Municipal manual laundries on up-to-date lines, viz., one at Wekanda and the other at Blomendahl, the former of which has thirty washing stones and the latter has thirty-two stones.

A scheme for the provision, as funds permit, of a series of additional Municipal laundries to serve the whole town, and replace the existing very insanitary private laundries, was submitted in Special Report No. 161 of April 19, 1922. At the time of writing the question of the erection of two such additional laundries, viz., one at Polwatta and the other at Skinner's road south is under consideration.

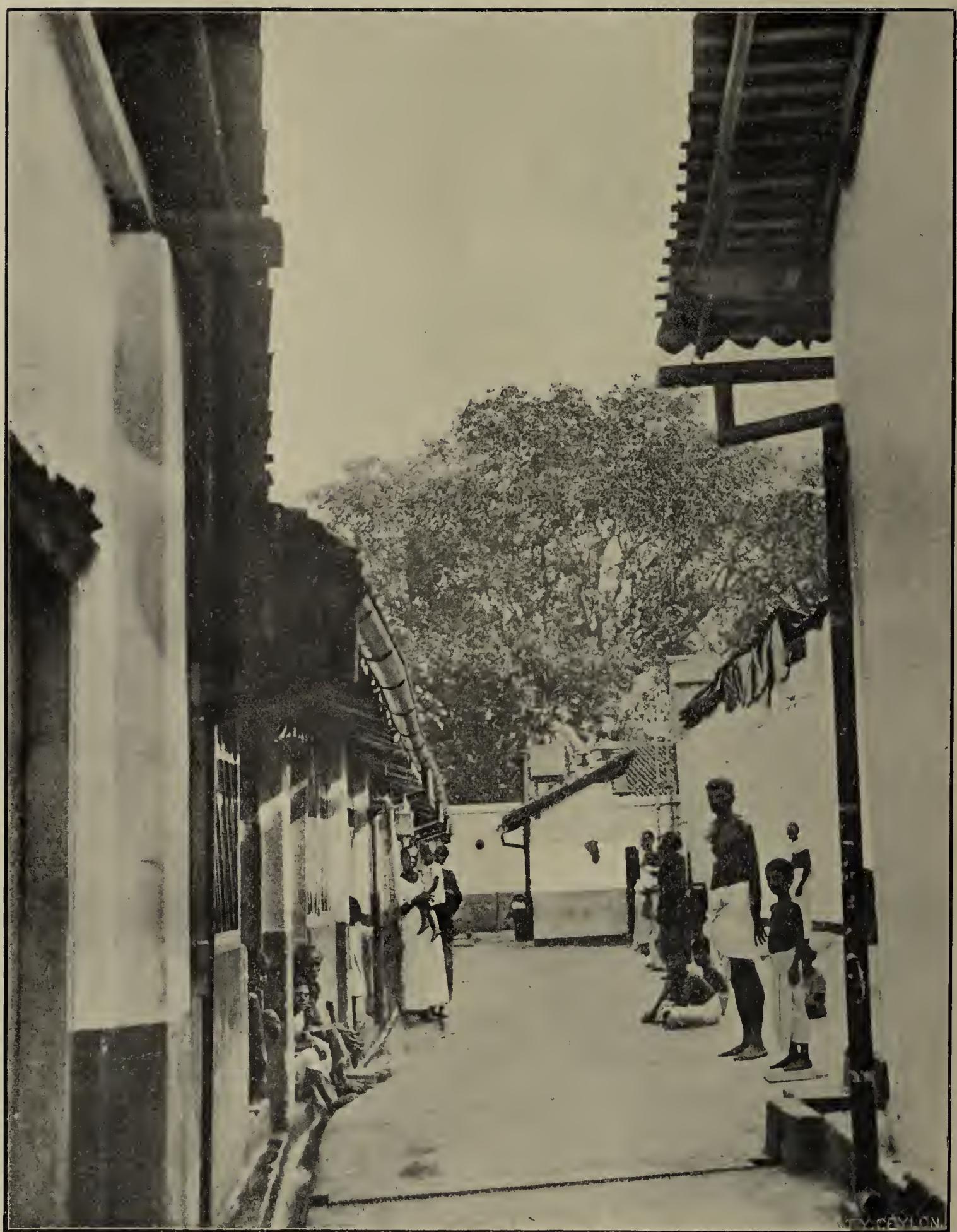
A great deal still remains to be done in the matter of providing suitable accommodation for dhobies in Colombo, and in the writer's opinion this should be regarded as a matter of first class importance when the annual allocation of funds for Municipal purposes is under consideration.





18/19, GINTUPITIYA STREET, BEFORE IMPROVEMENT.





18/19, GINTUPITIYA STREET. AFTER IMPROVEMENT.

## XXXI.—MOSQUITO PREVENTION.

The small mosquito prevention staff of twelve coolies and six overseers, employed by the Public Health Department, still works under the handicap of having no legal support for their efforts to prevent mosquito breeding within the town. Their work has, however, a considerable educative value as all breeding places found and mosquito larvae captured on private premises are invariably shown to the householders, who are instructed in measures required to prevent a recurrence.

The educated classes for the most part take a keen interest in this work and many of them now, when troubled with mosquitoes, make a mosquito survey of their premises before requisitioning the services of the Public Health Department. Others, it must be admitted, still rely upon their immunity from legal action, and make no personal effort to keep their premises free from mosquito breeding places.

It is hoped that, as the result of the propaganda and demonstrations carried on by the Municipal staff, public opinion will, at no distant date, regard mosquito breeding as a preventable nuisance and source of danger to health, and demand that it be made a punishable offence under the public health laws.

(56) *Anti-Mosquito Work, 1926.*

## (1) Complaints from Householders.

Number of complaints received ...	...	...	222
Number of premises visited ...	...	...	1,113
Number of potential breeding places found ...	...	...	39,053
Number of actual breeding places found ...	...	...	2,979

## (2) General Inspection Work.

Number of premises visited ...	...	...	1,453
Number of tenements visited ...	...	...	323
Number of potential breeding places found ...	...	...	62,043
Number of actual breeding places found ...	...	...	3,929

## (3) Summary.

Number of complaints received ...	...	...	222
Number of premises inspected ...	...	...	2,566
Number of tenements inspected ...	...	...	323
Number of potential breeding places found ...	...	...	101,096
Number of actual breeding places found ...	...	...	6,908

## XXXII.—DISINFECTION AND CLEANSING.

*Disinfection.*—7,967 premises were disinfected during the year, and 147 van loads, comprising 3,448 articles of clothing, &c., were disinfected in the equifex steam disinfecter.

*Cleansing.*—4,730 private premises were scavenged by the Public Health Department Cleansing Gang; 1,257 cleansing and limewashing notices were served and 10,624 dwellings were, as a result, cleansed and limewashed by the owners or occupants.

## XXXIII.—HOUSING.

The creation of the post of Inspector of Insanitary Dwellings has, in the writer's opinion, been fully justified by the work carried out during the year by Mr. R. A. Horan.

The following is Mr. Horan's Report :--

## REPORT FOR 1926 OF THE INSPECTOR OF INSANITARY BUILDINGS.

A good deal of solid work has been done during 1926, chiefly in the insanitary areas of Gintupitiya, Brassfounder, and Chekku streets, 31 premises comprising 342 tenements being completely improved, and certificates cancelling the closing order issued.

In addition to these 31 premises, there were, at the end of the year, 70 premises comprising 1,319 tenements in which improvements were being carried out, or, temporarily in abeyance, owing to lack of funds, or some such reason.

In 24 premises, including 392 tenements, the improvements have not been satisfactorily completed although work has been going on since 1925. In all these premises the improvements have been carried out without any unnecessary unhousing.

It has been necessary to enter 45 prosecutions against owners for failing to cause their premises to be vacated. This was only done where the improvements were much delayed, or not done at all, as it is our policy to have the improvements effected with the least possible hardship to the tenants. There is no law empowering prosecution of the owner for failing to carry out the improvements.

In all the 1,641 tenements dealt with during the year in only two cases did the occupants give trouble.

Of the three premises remaining closed at the end of the year, in two there are many co-owners who, as usual, cannot agree. In the other case the owner has died in India leaving no agent in Ceylon.

Two cases of the greatest importance to this work, i.e., the open space of fifteen feet between two rows of tenements being essential, were decided by the Municipal Magistrate in favour of the Council some months ago. Appeals have been lodged against these decisions but have not yet been heard.

R. A. HORAN,

Inspector of Insanitary Buildings.

## (57) Statement of Work done by the Inspector of Insanitary Buildings during the Year 1926.

1.	Number of plans called from Municipal Engineer	...	...	103
2.	Number of plans received	...	...	100
3.	Number of applications for "closing order"	...	...	65
4.	Number of "closing orders" issued	...	...	58
5.	Number of applications for "closing order" struck off	...	...	1
6.	Number of applications for "closing order" pending	...	...	17
7.	Number of closing notices affixed on buildings	...	...	830
8.	Number of premises vacated after "closing order"	...	...	3
9.	Number of tenements vacated under (8) above	...	...	106
10.	Number of persons dishoused	...	...	298
11.	Number of premises improved	...	...	31
	(a) Number of tenements in (11)	...	...	342
	(b) Number of tenements demolished in (11)	...	...	103
	(c) Number of persons dishoused in (11)	...	...	257
	(d) Number of new doors provided in (11)	...	...	47
	(e) Number of new windows provided in (11)	...	...	170
	(f) Number of doors enlarged in (11)	...	...	202
	(g) Number of windows enlarged in (11)	...	...	48
	(h) Number of rooms cemented in (11)	...	...	433
	(i) Number of masonry partitions removed in (11)	...	...	13
	(j) Number of plank partitions removed in (11)	...	...	29
	(k) Number of gunny partitions removed in (11)	...	...	—
	(l) Number of rooms in which masonry wall have been replaced by trellis in (11)	...	...	79
	(m) Space unroofed square feet in (11)	...	...	2,395
	(n) Length of roof raised in feet	...	...	1,416

## (58) List of Premises improved during 1926.

Ward.	Premises.	Ward.	Premises.
St. Paul's	... No. 5, Brassfounder street.	St. Paul's	... No. 63, Gintupitiya street.
St. Paul's	... No. 14, Brassfounder street.	St. Paul's	... No. 8, Andival street.
St. Paul's	... No. 20, Brassfounder street.	St. Paul's	... No. 9/10, Andival street.
St. Paul's	... No. 24, Brassfounder street.	Slave Island	... No. 22/1-22/10, Station passage.
St. Paul's	... No. 26, Brassfounder street.	Slave Island	... No. 22/23-22/40, Station passage.
St. Paul's	... No. 27, Brassfounder street.	Slave Island	... No. 22/65-22/70, Station passage.
St. Paul's	... No. 35, Brassfounder street.	Slave Island	{ ... { No. 13-21, Ferry lane.
St. Paul's	... No. 50, Brassfounder street.		49-52, The Mews.
St. Paul's	... No. 52, Brassfounder street.	Slave Island	{ ... { No. 64-74, Ferry lane.
St. Paul's	... No. 48, Chekku street.		2-6, Shorts road.
St. Paul's	... No. 53, Chekku street.	Slave Island	... No. 50-56, Malay street.
St. Paul's	... No. 54, Chekku street.	Kollupitiya	... No. 5, Muhandiram's road.
St. Paul's	... No. 60, Chekku street.	Kollupitiya	... No. 19, Muhandiram's road.
St. Paul's	... No. 94, Chekku street.	Kollupitiya	... No. 39, Muhandiram's road.
St. Paul's	... No. 96, Chekku street.	Kollupitiya	... No. 7, Kollupitiya lane.
St. Paul's	... No. 106, Chekku street.	Kollupitiya	... No. 14, Kollupitiya lane.
St. Paul's	... No. 18/19, Gintupitiya street.		

## XXXIV.—DISPENSARIES.

The opening of a Free Municipal Dispensary at Silversmith Street, to serve New Bazaar and San Sebastian Wards, brought the number of these establishments up to five as under :—

Slave Island	...	...	Established February 1, 1910.
St. Paul's	...	...	Established July 1, 1914.
Maradana	...	...	Established November 1, 1919.
Modera	...	...	Established April 1, 1922.
New Bazaar and San Sebastian	...	...	Established March 1, 1926.

It was further decided during the year to establish a sixth dispensary at Wellawatta, which resolution has since been given effect to.

Upon completion of the new Child Welfare Centre and Dispensary at Gintupitiya street, the present St. Paul's Dispensary at Barber street will be closed.

The following is a summary of the work done at the various dispensaries during the year :—

## (59) Work done at the Municipal Dispensaries in 1926.

## (a) Slave Island Dispensary.

Number of patients treated	...	...	...	18,446
Number of visits by patients	...	...	...	34,434
Daily average attendance	...	...	...	110
Number of outdoor visits paid by the Medical Officer		...	...	140
Number of cases sent in by Health Visitors' tickets		...	...	161
Number of labour cases in which medical or surgical aid rendered	...	...	...	2
Number of Municipal employees treated	...	...	...	181
Number of subjects inoculated against Typhoid	...	...	...	6

(b) *St. Paul's Dispensary.*

Number of patients treated	...	...	...	13,114
Number of visits by patients	...	...	...	18,603
Daily average attendance	...	...	...	60
Number of outdoor visits paid by the Medical Officer	...	...	...	43
Number of cases sent in by Health Visitors' tickets	...	...	...	48
Number of labour cases where medical or surgical aid rendered	...	...	...	11
Number of Municipal employees treated	...	...	...	72
Number of subjects inoculated against Typhoid	...	...	...	23

(c) *Maradana Dispensary.*

Number of patients treated	...	...	...	22,795
Number of visits by patients	...	...	...	13,298
Daily average attendance	...	...	...	74
Number of outdoor visits paid by the Medical Officer	...	...	...	125
Number of cases sent in by Health Visitors' tickets	...	...	...	137
Number of labour cases where medical or surgical aid rendered	...	...	...	—
Number of Municipal employees treated	...	...	...	7
Number of subjects inoculated against Typhoid	...	...	...	26

(d) *Modera Dispensary.*

Number of patients treated	...	...	...	12,073
Number of visits by patients	...	...	...	19,423
Daily average attendance	...	...	...	63
Number of outdoor visits paid by the Medical Officer	...	...	...	291
Number of cases sent in by Health Visitors' tickets	...	...	...	14
Number of labour cases where medical or surgical aid rendered	...	...	...	18
Number of Municipal employees treated	...	...	...	181
Number of subjects inoculated against Typhoid	...	...	...	12

(e) *New Bazaar Dispensary.*

(Opened in March, 1926).

Number of patients treated	...	...	...	6,445
Number of visits by patients	...	...	...	12,460
Daily average attendance	...	...	...	52
Number of outdoor visits paid by the Medical Officer	...	...	...	22
Number of cases sent in by Health Visitors' tickets	...	...	...	64
Number of labour cases where medical or surgical aid rendered	...	...	...	2
Number of Municipal employees treated	...	...	...	49
Number of subjects inoculated against Typhoid	...	...	...	1

## XXXV.—CHILD WELFARE.

The staff employed upon this important and rapidly growing branch of Public Health work was increased during the year by the appointment of two, making a total of thirteen Health Visitors, one of whom was posted to Kotahena and the other to San Sebastian Ward. One additional Midwife was also appointed and posted to St. Paul's bringing the total up to eight.

Dr. (Mrs.) Rowlands' report upon the work of this branch during the year is reproduced hereafter. As she points out, the marked improvement in the infant mortality rate during the last two years is a most gratifying feature, and is a great encouragement for the future. It reflects great credit upon Dr. Rowlands and her Health Visitors and Midwives, and it is with much regret that I have to record Dr. Rowlands' decision to resign her appointment on account of ill health.

As regards the supply, by this branch, of free milk to infants, a total of 2,162 gallons 5 pints and 8 ounces was issued at a cost of Rs. 5,190·90. As Dr. Rowlands points out there are many more poor children and, I may add, mothers, to whom the issue of good clean milk, either free or at cost price, would be a great boon; but no material extension of this form of relief should, in my opinion, be embarked upon, unless due regard is had to the selection of suitable recipients, supervision in regard to the purchase and issue of milk, and the adoption of a proper system of keeping the accounts by the branch concerned. As a preliminary to this it is advisable that there should be established a system of milk depôts for the receipt, storage, manipulation, and distribution of the milk.

## DR. (MRS.) ROWLANDS' REPORT.

The Medical Officer of Health, Colombo.

I HAVE the honour to submit my report on the Maternity and Child Welfare Branch of your Department for the year ending December 31, 1926.

During the year under review, which was my second year of service, the system of work has had no very material changes, and we continued to work without a centre, which I hoped would have been established before the end of the year, without which nevertheless the results were satisfactory. There has, however, been a slight increase in the staff, the number of Health Visitors increasing from 11 in 1925 to 13 in 1926 and the Midwives from 7 in 1925 to 8 in 1926.

A very noteworthy feature of our campaign and gratifying too, is that the poor now seek our assistance and advice very readily and take advantage of the Ante-Natal Clinics, thus affording us a much greater scope for the achievement of the object of Maternity and Child Welfare work.

#### *Health Visitors.*

A few transfers were effected, as found necessary, during the year. The thirteen Health Visitors were posted for duty as follows :—

Two in St. Paul's.	Three in Maradana.
Two in Slave Island.	One in Kotahena.
Two in New Bazaar.	One in San Sebastian.
Two in Mutwal.	

The posting of two new Health Visitors, viz., one in Kotahena and one in San Sebastian was found necessary for the supervision of the work of the Midwives in those areas who previously to that had none. Although the nett result of our campaign has been satisfactory, it may not be out of place to emphasise the fact that had there been more co-operation and discipline amongst some members of my staff the results might have been far more satisfactory. There have been 89,254 visits paid by the Health Visitors to the homes of the poor in 1926, which is an increase of 2,785 over the same period in 1925.

#### *Midwifery.*

This section of the scheme has continued to work very satisfactorily and a marked increase in the number of cases attended to by our Midwives is noticed in the figures shown later under this same heading.

There were seven Midwives in 1925 and eight in 1926, being posted as follows :—

One in San Sebastian	One in Mutwal
Two in St. Paul's	One in Slave Island
One in New Bazaar	One in Maradana
One in Kotahena	

The number of confinements attended by these Midwives was 1,009 in 1926, as compared with 872 in 1925 and 529 in 1924. This represents the birth of 1,024 children. It might be as well to state that this increase was not borne proportionately by all the Midwives, but was more confined to those in St. Paul's, San Sebastian, and Slave Island Wards.

During 1926 two cases of operative midwifery were undertaken by me, in which one was successfully conducted with forceps, although under very adverse conditions, and the other a case where a morbidly adherent placenta was digitally removed, this one also being successful. Both of these cases were in Wolfendahl.

#### *Ante-Natal Clinics.*

As in 1925 these clinics were conducted by me weekly at each of the five Municipal Dispensaries during the year under review, where the attendance was larger than the previous year.

435 ante-natal cases were treated by me at these clinics, as compared with 336 in 1925. 656 other patients were also treated, as compared with 417 in 1925, these being chiefly post-natal cases and infants.

#### *Free Milk.*

126 infants were supplied with free milk during 1926, as compared with 70 in 1925. All of these without an exception were very deserving cases and there are still many more who could do with free milk, provided the vote under this heading could be increased.

As the supply of milk is on the increase it is much to be regretted that the establishment of distributing depôts, where both quality and method will be carefully regulated, is delayed.

#### *Results.*

The results of our work for the year under review is satisfactory as reckoned from comparative figures hereunder :—

- Infant mortality rate per thousand for 1924 was 239.
- Infant mortality rate per thousand for 1925 was 220.
- Infant mortality rate per thousand for 1926 was 204.

The above rate is very gratifying, and I hope that this will decrease more as time goes on.

I regret, however, that particularly at this juncture I was obliged to tender my resignation due to ill-health, and in so doing must extend to you my sincerest wishes for continued success in the undertaking.

In conclusion I must thank you for the very kind and courteous manner in which you have at all times received me on matters requiring your assistance and advice.

RACHEL S. ROWLANDS,  
Assistant Medical Officer of Health (Child Welfare.)

## (60) List of Cases conducted by Midwives, 1926.

Name.	Ward.	Number of Cases.												
		January.	February.	March	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Angelina Fernando	San Sebastian	19	11	13	12	9	13	17	18	14	16	32	15	189
P. Medlin Perera.	New Bazaar	5	9	4	4	7	4	7	6	4	15	14	8	87
Emily Direckze ...	Kotahena	11	9	6	7	7	9	10	2	2	9	8	9	89
D. B. Dias ...	Maradana	7	8	7	5	8	4	8	9	12	10	12	6	96
Rosaline Perera ...	Slave Island	22	15	19	7	17	15	13	14	16	15	22	16	191
N. Dharmaratna ...	St. Paul's	8	20	11	20	14	14	23	16	14	20	21	37	218
M. Sathasivam ...	St. Paul's	2	5	6	10	2	11	5	5	9	11	11	5	82
D. M. Pallewela ...	Mutwal	—	—	2	4	3	4	3	4	8	7	15	6	56
Nona Hamy ...	Mutwal	9	6	1	—	—	—	—	—	—	—	—	—	16
														Total ... 1,024

## (61) Statement of Expenditure on Milk Supplied to Infants by the Child Welfare Branch during 1926.

Month.	Amount. Rs. c.	Month.	Amount. Rs. c.
January ...	347 90	August ...	442 60
February ...	311 90	September ...	402 40
March ...	433 50	October ...	517 20
April ...	438 20	November ...	424 0
May ...	502 40	December ...	440 50
June ...	467 90		
July ...	462 40	Total ...	5,190 90

## Non-Municipal Child Welfare Work.

*Ante-natal Clinic.*—At the Government Ante-natal Clinic, with 948 first visits during the year, as against 658 during the previous year, there is evidence of a steadily growing popularity.

*The Child Welfare Association's Crèche.*

The Honorary Secretary of the Crèche has kindly furnished the following figures for the year 1926.

Average daily attendance = 42·137 children ranging from one week to ten years of age.

The crèche, in addition to being a great boon to poor working mothers, has a great educative value.

*Ceylon Social Service League.*

The activities of the Ceylon Social Service League cover a wide field of philanthropic endeavour, including four free milk depôts, a clinic for poor women and children, slum visitation, and a number of free night schools.

The following information regarding the work at the milk depôts during the year 1926 has been kindly furnished by the Honorary Secretary of the Women's Branch:—

At Dean's road depôt about 34 babies, on an average, are fed, and 3,780 bottles of milk were distributed during the year. At Slave Island depôt an average of 35 babies are fed, and 4,511 bottles of milk were distributed.

At Kotahena depôt an average of 30 babies are fed, and 9 to 10 bottles of milk were distributed daily.

At Bambalapitiya depôt, which was recently opened, 16 babies are fed, and about 350 bottles of milk have so far been distributed.

## XXXVI.—BACTERIOLOGICAL LABORATORY.

Attention is invited to Dr. Hirst's most interesting and instructive report annexed. His investigations in regard to fevers in Colombo confirm the conclusion, so often recorded in the Public Health Department reports, that most of the fatal cases reported in Colombo as "continued fever" are in reality cases of enteric fever, and justify the action taken so long ago as 1903 to include such cases in the list of notifiable infectious diseases.

The occurrence in Colombo of a case of melioidosis in a European is interesting. This very fatal fever is said to be not uncommon in Rangoon, but the case referred to is the only one so far that has been recorded in Colombo.

Dr. Hirst remarks on the need for further investigation regarding the various types of dysentery and diarrhoea here, and emphasises the difficulty of obtaining the requisite material for examination in the Municipal Laboratory.

Special attention is invited to Dr. Hirst's illuminating disquisition on the parasitology of plague, a subject in regard to which he is a recognized authority.

## XXXVII.—ANALYTICAL WORK.

Chemical analyses are carried out on behalf of the Council in the laboratory of Mr. A. Bruce, the City Analyst. His report for the year 1926 is annexed.

## XXXVIII.—STAFF CHANGES.

The following changes in the personnel of the staff occurred during the year :—

*Assistant Medical Officer of Health.*—Dr. F. N. Jayawardana appointed Third Assistant Medical Officer of Health on August 3, 1926, in place of Dr. E. R. Loos, retired.

*Medical Officers.*—Dr. James F. Peiris appointed Medical Officer, New Bazaar Dispensary, on March 12, 1926. (New post.)

*Inspectors.*—Mr. M. M. Molligoda, Relief Sanitary Inspector, appointed Sanitary Inspector on January 1, 1926, in place of Mr. T. E. Karunatileke, deceased.

Mr. J. P. J. Mendis, Relief Sanitary Inspector, appointed Sanitary Inspector on April 10, 1926, in place of Mr. C. B. Brohier, retired.

*Relief Inspector.*—Mr. J. P. J. Mendis, Sub-Inspector, appointed Relief Sanitary Inspector on January 1, 1926, in place of Mr. M. M. Molligoda, promoted.

Mr. R. C. Mackellar, Supervisor, Conservancy Branch, appointed Relief Sanitary Inspector on July 5, 1926, in place of Mr. J. P. J. Mendis, promoted.

*Sub-Inspector.*—Mr. H. B. Karunatileke appointed Sanitary Sub-Inspector on March 1, 1926, in place of Mr. J. P. J. Mendis, promoted.

*Clerks.*—Mr. E. B. Fernando appointed Clerk on March 3, 1926, in place of Mr. M. Ramapulle, resigned.

Mr. J. R. G. Vaz appointed Clerk on June 30, 1926. (New post.)

Mr. F. A. de Silva appointed Clerk on September 1, 1926, as a result of Mr. M. H. C. Cooray's promotion as Head Clerk, Municipal Assessor's Department.

*Apothecaries.*—Mr. A. N. P. Gunatilleke appointed Clerk-Apothecary, Slave Island Dispensary on January 2, 1926. (New post.)

Mr. A. Canagasunderam appointed Relieving Apothecary on March 9, 1926. (New post.)

Mr. H. S. A. Fernando appointed Apothecary, Slave Island Dispensary, on May 7, 1926, in place of Mr. A. N. P. Gunatilleke, transferred to New Bazaar Dispensary.

Mr. G. P. Jayawardana appointed Apothecary on December 24, 1926, in place of Mr. A. Canagasunderam, discontinued.

*Market-keepers.*—Mr. D. L. Perera, Market-keeper, St. John's market, appointed Market-keeper, Slave Island market, on May 15, 1926. (New post.)

Mr. L. I. V. de Alwis appointed Assistant Market-keeper, Kotahena market, on January 5, 1926, in place of Mr. D. C. Kottachi, promoted.

Mr. P. D. Martin appointed Assistant Market-keeper, Dean's road market, on January 5, 1926, in place of Mr. B. de Andrade, appointed Assistant Superintendent, Slaughter-house.

Mr. M. A. Perera appointed Assistant Market-keeper, Edinburgh market, on May 17, 1926, as a result of Mr. D. L. Perera's promotion.

Mr. Leo Fernandes appointed Assistant Market-keeper, Slave Island, on May 15, 1926. (New post.)

Mr. J. A. M. Samarasinghe appointed Assistant Market-keeper, Kollupitiya market, on April 23, 1926, in place of Mr. T. H. Dole, resigned.

Mr. S. A. Mariampulle, appointed Assistant Market-keeper, Kollupitiya market, on July 5, 1926, in place of Mr. J. A. M. Samarasinghe, resigned.

*Health Visitors.*—Mrs. I. Marsden appointed Health Visitor, New Bazaar Dispensary, on January 27, 1926. (New post.)

Miss A. Schokman appointed Health Visitor, New Bazaar Dispensary, on January 27, 1926. (New post.)

*Midwives.*—Mrs. Mary Sathasivam appointed Midwife, St. Paul's Division, on January 4, 1926. (New post.)

Mrs. D. M. Pallewela appointed Midwife, Mutwal Division, on March 1, 1926, in place of midwife Nonno Hamy, retired.

*Telephone Operator.*—Mr. Albert de Alwis appointed Telephone Operator, on July 20, 1926, in place of Mr. L. A. Nanayakkara, resigned.

## THE END.

As I go on leave at the end of the current month, prior to retirement after 24 years and 8 months service as Medical Officer of Health of Colombo, this is the last Administration Report which I shall be privileged to submit. I, therefore, take this opportunity of gratefully acknowledging the very loyal and wholehearted assistance which I have always received from all ranks of the Department, without which it would have been impossible to carry on successfully the work of the Department.

The best that I can wish my successor, and this I most sincerely do, is that the staff will continue to afford him the same measure of loyalty and assistance that they have always given to myself.

W. MARSHALL PHILIP,

Maligakanda, March 18, 1927.

Medical Officer of Health.

*Annexure A.*

## REPORT OF THE CITY MICROBIOLOGIST FOR 1926.

THE medical activities of this laboratory may be divided into two main categories, the epidemiological and the diagnostic.

The results of comprehensive inquiries into the spread of plague and hookworm, and into the bacteriology of water and food borne diseases, such as enteric and cholera, have been summarized in this series of annual reports. They serve to illustrate the epidemiological side of the work. We now know how plague is spread in Colombo and where it is liable to occur, while the position as regards infection through water and food and hookworm infected soil is fairly clear. Our knowledge of the spread of such infective organisms outside the human body is, on the whole, fairly satisfactory from a practical point of view.

The great advantage of this class of investigation is that suitable material is readily obtainable for examination. Thus bubonic plague is a disease of rats spread by fleas. We have ample means of examining rats and collecting fleas in all parts of the city. The infestation of the soil with hookworm larvae can be determined from specimens collected by the laboratory staff, the same is true of work on the water supply, wells, polluted streams and rivers. The opportunities on the epidemiological side are, therefore, satisfactory. Hence the progress achieved.

The weak spot in our defences against the man-killing bowel infections, such as enteric and dysentery, is on the side of the personal infection from the individual patient; not only must there be many unrecognized cases of these diseases spreading the infection by personal contact in the acute infective stage, but the number of apparently healthy carriers of both enteric and dysentery is indubitably very large in such a city as Colombo.

From the preventive point of view the aim of the diagnostic side of the laboratory work is to enable these personal foci of infection to be localized and to give scientific accuracy to our vital statistics, which are vitiated by diagnoses such as "continued fever," the equivalent of a much abused expression "pyrexia of unknown origin," which was the bane of the army epidemiologists in prebacteriological days. This class of work is also important in its personal aspects since the bacteriological diagnosis of communicable disease is becoming ever more necessary for treatment as well as for prevention. Formerly diseases such as pneumonia, dysentery, and enteric were treated as if they were definite clinical entities attributable to a single cause. We now know that they express the reaction of the human body to three separate groups of micro-organisms, some of which differ very markedly from others of the group.

Pneumonia is the principal cause of mortality in Colombo; 942 deaths in 1925 and 926 in 1926. Our knowledge of the bacteriology of this dangerous disease is rapidly increasing. The principal types have been differentiated in America, Europe, South Africa, and India, but so far no systematic work on these lines has been done in Ceylon. The types of pneumonia, like those of enteric and dysentery, vary considerably in their geographical distribution so that the problem must be investigated anew for each region of the world. Some types respond much more readily to treatment than others.

The increasing aggregation of masses of the population in large towns seems to be associated with a tendency to a relative increase in the prevalence of air borne diseases such as influenza, pneumonia, and cerebro-spinal meningitis. As the difficulty in providing adequate air space and isolating individual sufferers increases it becomes correspondingly difficult to control the spread of these viruses outside the body.

Eventually, no doubt, the problem will solve itself by a process of natural selection, those racial strains which cannot acquire the necessary immunity to air borne respiratory infections being gradually eliminated. But there are good grounds for hope that bacteriological research will provide a means of acquiring an artificial immunity against this group of diseases corresponding to that already available for smallpox, enteric, and other diseases. There also appears to be a promising field for the use of autogenous vaccines in treatment.

As regards enteric and the continued fevers generally which were responsible for 333 deaths in 1925 and 218 deaths in 1926, all three of the better known pathogenic bacteria *B. typhosus*, *B. paratyphosus A.* and *B.* have been isolated in Colombo. It is clear that the majority of the clinically typical cases are caused by *B. typhosus*, but the exact proportion attributable to the genuine paratyphoid bacilli is still unknown. There is, therefore, an element of considerable uncertainty regarding the proper constitution of an anti-enteric vaccine. It is clear that *B. typhosus* must be incorporated since this is not only the commonest enteric organism in Colombo but also the most deadly. So far as my information extends at present the incidence of both the common paratyphoids is so low as to be almost negligible from a general prophylactic point of view, the great majority of enteric-like fevers not due to *B. typhosus* being the result of invasion of the body by a miscellaneous group of widely distributed bacilli of low pathogenicity and epidemicity which have not yet been adequately studied.

One example of this type isolated during the year under review from a case of long continued enteric-like fever in a child may turn out to be new.

Since malaria is not indigenous to Colombo it is probable that most of the cases diagnosed as continued fever of any duration are some kind of parenteric or enteric fever, and since the mortality from the typical paratyphoid bacilli and the atypical "parenteric" group of miscellaneous organisms is low, we may, perhaps, justifiably presume that most of the mortality attributed to "continued fever" is occasioned by infection with the classical *B. typhosus* of Eberth.

Knowledge of the tropical fevers of obscure origin is advancing fast. A new tropical variety of typhus fever has been recently discovered in the Malay States by the use of agglutination tests with certain strains of proteus bacilli, i.e., by an application of the Weil-Felix reaction used by myself and others for the diagnosis of the typhus in the Near East in 1918.

The Government Bacteriologist informs me that *B. whitmori*, the causative organism of melioidosis, a very fatal fever not uncommon in Rangoon, has recently been isolated from a fatal case of obscure fever in Colombo showing characteristic pulmonary lesions at post-mortem. I am keeping a lookout for the disease in rats which have been found to be infected with the organism in the Malay Peninsula.

Exact information regarding the relative prevalence of the various types of dysentery and diarrhoea in Colombo is also lacking, but it is clear that bacillary dysentery is far commoner than amoebic and that the *Flexner* group of dysentery bacilli are more frequently isolated than the *Shiga* type.

Laboratory diagnosis is particularly important in the case of the dysenteries as a guide to treatment. The bacillary type requires to be treated on quite different lines to the amoebic. In this case prompt diagnosis is usually possible by the use of the microscope as shown by Willmore, Thompson, myself, and others in Egypt during the war. The experience of the great war added enormously to our knowledge of this disease and resulted in great advances in its treatment and a correspondingly great reduction in sickness and mortality. But in spite of the number of illuminating articles on the subject which have appeared of late years in the medical press, practice in Colombo still lags far behind the possibilities of improved results.

In these days 243 deaths from dysentery in 1925 and 213 in 1926 seem excessive.

It will be realized from the foregoing that there are great opportunities for investigation in the field of clinical bacteriology. The great difficulty, however, is to get into touch with the requisite material.

Only a portion of the sufferers from grave communicable diseases are ever seen by a practitioner of modern medicine. Many of the latter who fully realize the importance of bacteriological diagnosis and do their best to provide suitable laboratory specimens from their patients are often unable to devote sufficient time to supervise their proper collection and transmission to the laboratory. The difficulties are much greater in the tropics than in temperate climes. Fresh materials are essential for the correct diagnosis of dysentery at Colombo temperatures. A specimen more than two hours old is often useless.

Unfortunately some of the less reputable practitioners are not merely unmindful of the advantages of free laboratory diagnosis but actually place obstacles in the way of specimens being obtained by officers of the Public Health Department.

To my mind it is clear that our chief source of information must be the hospitals, dispensaries, jails, and civil and military institutions generally.

The merging of the Municipal Enteric Hospital with the Government Hospital at Angoda during 1926 has deprived this laboratory of the one of the few avenues of direct access to the right kind of clinical material. It would seem necessary to take greater advantage of the material available in the Government hospitals situated in Colombo.

In this connection it may be well to reiterate the need, emphasised in my Annual Report for 1924, for greater co-ordination between the clinical and laboratory side of medical research in this Colony. The discovery of a particular germ in a particular disease is no proof of their causal connection. A number of interesting organisms have been isolated in Ceylon, whose relation to disease will remain obscure till exact clinical observations of the state of the patient harbouring the suspected pathogenic germ are correlated with the bacteriological findings.

We seem to have arrived at a critical juncture in the development of medicine in Ceylon. Advances in scientific knowledge seem to be increasingly outstripping their application in civil medical practice, while a well supported movement is on foot for a return to old empirical traditions in the shape of the Oriental cults of Ayurveda.

I spent much time in 1926 as a member of the Committee on the Indigenous Systems of Medicine. The majority of the Committee reported in favour of the establishment of an official college of Ayurvedic medicine supported out of public funds.

The minority report signed by Dr. S. T. Gunasekara, Mr. C. T. Symons, and myself emphasised the difficulties that the official encouragement of any such so-called systems would place in the way of the betterment of the public health.

#### *Distribution of Clinical Specimens.*

	Examined for	Number Received.	Number Positive.
Diagnostic service for practitioners ...	Enteric	104	28
	Tuberculosis	58	14
	Dysentery	112	19
	Diphtheria	27	12
	Hookworm	95	51
	Malaria	19	1
	Various	139	81
Public Health Department ...	Enteric	533	19
	Human plague	11	3
	Dysentery	11	3
	Hookworm	35	24
	Tuberculosis	26	4
	Malaria	16	6
	Diphtheria	20	0
	Cholera	1	0
	Various	19	15
		1,226	280

Of the 637 enteric specimens, 606 comprise finger blood for Widal's reaction, 1 blood culture, 27 faeces, and 3 urines. *B. typhosus* was isolated from 3 specimens.

(b) General Distribution of Specimens examined during 1926.

Clinical specimens	...	...	...	1,226
Town water	...	...	...	184
Rat fleas for species distribution	...	...	...	13,782
Rodents for plague :—				
Port Commission	...	...	...	5,448
Veterinary Department	...	...	...	15,718
Public Health Department	...	...	...	1,535
Veterinary Department :—				
Rats for flea index	...	...	...	5,533
Goats blood for anthrax	...	...	...	1,342
Miscellaneous	...	...	...	272
				<hr/>
				45,040

(c) Distribution of Rodents examined for Plague in 1926.

(1) By mode of Capture.

	Species.	Number examined.	Number infected.	Percentage infected.
Trapped rats	{ R. rattus	16,702	3	0·02
	R. norvegicus	3,065	—	—
	M. musculus	816	—	—
	Bandicoots	2	—	—
Rats found dead.	{ R. rattus	29	—	—
	R. norvegicus	40	4	10·0
	M. musculus	4	1	25·0
	Bandicoots	1	—	—
Rats killed by Clayton machines.	{ R. rattus	514	—	—
	R. norvegicus	935	—	—
	M. musculus	591	—	—
	Bandicoots	2	—	—
		<hr/>	<hr/>	<hr/>
		22,701	8	0·04
		<hr/>	<hr/>	<hr/>

(2) By Species and Source.

		Trapped Alive.			Found Dead.			Killed by Fumigation.		
		Number examined.	Number infected.	Percentage infected.	Number examined.	Number infected.	Percentage infected.	Number examined.	Number infected.	Percentage infected.
R. rattus	Veterinary Department	12,988	1	0·008	...	4	—	—	—	—
	Public Health Department	—	—	—	...	9	—	—	329	—
	Port Commission	3,714	2	0·06	...	16	—	—	185	—
R. norvegicus	Veterinary Department	2,435	—	—	...	16	—	—	—	—
	Public Health Department	—	—	—	...	16	4	25·0	679	—
	Port Commission	630	—	—	...	8	—	—	256	—
M. musculus	Veterinary Department	273	—	—	...	—	—	—	—	—
	Public Health Department	—	—	—	...	—	—	—	—	—
	Port Commission	543	—	—	...	1	1	100·00	498	—

Two bandicoots trapped alive by the Veterinary Department and one dead bandicoot forwarded by the Public Health Department and two bandicoots killed by Clayton machines by the Public Health Department were examined and found to be negative.

(d) Monthly Flea Index.

Month.	Number of Rats examined.	Flea Index.	Month.	Number of Rats examined.	Flea Index.
January	397	1·56	July	611	3·36
February	360	1·55	August	132	2·79
March	325	2·09	September	227	2·07
April	945	2·03	October	167	2·89
May	1,038	2·12	November	390	3·53
June	705	3·32	December	236	3·01

## PARASITOLOGY OF PLAGUE.

The Memoir on the Parasitology of Plague referred to in my last Annual Report is now complete. Part I. has already been published. The observations recorded therein on the experimental transmission of plague by the Colombo rat fleas *X. astia* and *X. cheopis*, and their habits and biting powers have already been briefly summarized in my Report for 1924.

Part II. will be issued shortly. It deals with the epidemiological side of the subject.

In the First Section the salient facts regarding the geographical distribution of rat fleas are reviewed. The important point emerging is that the natural distribution of these insect parasites has been artificially altered by human agency, and that dangerously efficient plague-carrying species such as *X. cheopis* have been widely dispersed from their ancestral homes by maritime commercial intercourse between the nations. *X. cheopis*, originally an African flea, has established itself at many points on the shores of Australia, America, Japan, and Europe.

Outbreaks of plague have occurred at a large number stations where this flea has been introduced. The disease among the rats has been practically restricted to the *cheopis* infested regions though plague has spread enzootically among a variety of wild rodents by a variety of methods of contagion in some of the colder regions of the earth. Moreover, there is a close correspondence between the season of *cheopis* multiplication and that of plague in all such localities for which data are available, especially as regards human plague. Other species of rat flea seem able to continue an outbreak of rat plague initiated by *X. cheopis* for some time after the human epidemic has subsided.

Colombo itself is the most striking example of an outbreak of plague following the introduction of *X. cheopis*, since in this instance the results of a pre-plague rat flea survey are available. *X. cheopis* was not found till after plague broke out, the indigenous rat flea being *X. astia*.

Part I., Section II., of the Memoir deals with flea species as a factor governing the spread of plague.

Epidemiologists the world over are now taking a much more active interest in this important and long neglected subject, but there seem to be many misconceptions as to the method of flea survey which should be adopted and the interpretation of the results.

As regards method : clearly the rat flea collections should be representative of the flea fauna of the district surveyed, but unless due attention is paid to the nature of the premises where the traps are laid, to the season of the year, and the species of rodent trapped the results obtained may be most misleading.

Thus if all the traps were laid in the Chalmers Granaries in Colombo, or in the docks of such a city as Liverpool, the proportion of *X. cheopis* found on the rats would be far larger than if they were laid in ordinary domestic premises in the outskirts of the town. The results of such collections would be more representative of the rat fleas of the port of origin than of the port of entry. Similarly, if we wish to know the maximum proportion of plague fleas liable to be caught on rats, it is no use searching them at a season of the year unfavourable to the reproduction of the plague-carrying species. Thus *X. cheopis* multiplies best between the range of temperature from about 68°F. to about 78°F. in a humid atmosphere. In practice when climate is cooler or hotter than this or very dry there will be comparatively few *X. cheopis* on the rats and little or no bubonic plague. Again the fleas found on the species of rodents which seldom enter houses must be distinguished from those occurring on domestic rats.

It is not sufficient to state the percentage proportion of the various species of fleas found on the rats of a district. The researches of the Plague Commission in India show clearly that the amount of plague in a district largely depends on the size of its rat flea population, which they measured by counting the average number of fleas per rat.

It is clear that 100 per cent. *X. cheopis* with one flea per rat is less significant of danger from plague than, say, 10 per cent. *X. cheopis* with twenty fleas per rat, even if we leave out of consideration the possibility of a certain amount of spread of plague by the 90 per cent. belonging to some other species.

I have attempted to give more precision to the subject by laying down a provisional series of parasitological principles which are reproduced below :—

- (1) *The incidence of bubonic rat plague is primarily governed by the magnitude of the respective populations of plague-carrying flea species infesting the rats of any given district.*
- (2) *The population of any species of rat flea in any given locality varies according to the rat population, the nesting conditions, the suitability of the climatic conditions prevailing in the locality for breeding the particular species, and according to the number of fleas introduced in all stages of development from elsewhere.*
- (3) *The flea population requisite for the continuous propagation of the epizootic varies in magnitude according to the species of flea.*
- (4) *The vector efficiency of each individual flea of each sex and of each species and therefore the population effective for transmission varies according to the climatic conditions.*
- (5) *The degree of dependence of the human epidemic on the rat epizootic varies directly with the power of the species of rat fleas concerned in the spread of the epizootic to parasitise man, and indirectly with the intimacy of association between man and the flea-bearing rats inhabiting the locality under consideration. The term nesting conditions includes natural enemies of the flea larva and larval food supply.*

With the aid of the Director of Statistics I have carried out a further analysis of the results of the 1922-1924 rat flea survey of Colombo. The results indicate a correlation between *cheopis* prevalence and plague incidence which is almost linear for the greater portion of the curve, but reasons are given for concluding that such a marked correlation is only to be expected under certain conditions, and that the anticipations raised by some workers that similar results will be obtained in Northern India are not likely to be fulfilled.

Part II., Section III., comprises an analysis of the operation of the flea species factor in Europe, Australia and the Far East, Ceylon, and India.

The general results of the flea survey of Colombo have already been discussed in previous Annual Reports. Subsequent observations have shown that the zones of *X. cheopis* prevalence are remarkably stable, and additional confirmation of the well known fact that *R. rattus* is an extremely home loving rodent showing little or no tendency to migrate from its accustomed haunts. But for this fortunate circumstance *X. cheopis* would by now have spread uniformly through Colombo District and the incidence of human and rat plague would have been about equal in all the more populous and insanitary districts.

Each year that passes affords yet more evidence of the threefold association between imported grain, *X. cheopis*, and plague.

At the suggestion of Dr. Norman White, I have examined 1,000 rats from the docks, lighters, granaries, and plague area generally for presence of the Rangoon rat *R. concolor*, a slenderer species than *R. rattus kandianus*, the Colombo variety of *R. rattus*.

The females are easily distinguished by the arrangement of the mammae.

Only one *R. concolor* was detected, it was caught in the Chalmers Granaries where Rangoon imported rice is stored. I think there can be very little doubt that grain infested with plague infected fleas is the principal vehicle of the plague infection in Colombo. If it was mainly a question of the importation of infected rats one would expect to find a much greater proportion of *R. concolor* in the vicinity of the import godowns.

It may be pointed out that *R. concolor* is not nearly so domesticated as *R. rattus*. If *R. concolor* ever established itself in Colombo, as *X. cheopis* has done, the plague infected area would probably rapidly extend till it was out of control.

The situation as regards the flea species factor is becoming clearer in India and Burma. A definite relationship seems to exist between great *astia* predominance and relative immunity to plague in the maritime stations along the coast, such as Bombay, Rangoon, and Madras. In this type of station the flea species factor must be of considerable importance. The *cheopis* flea index, i.e., average number of *cheopis* per rat, in the different districts of this region should be an effective guide to plague preventive measures.

The distribution of rat fleas in India as a whole seems to accord with well known zoo-geographical principles.

From a practical point of view the flea species factor seems of greatest importance in those Indian areas where *X. cheopis* is not indigenous, but where it is liable to be introduced.

Thus *X. cheopis* and *X. brasiliensis* have probably been indigenous to Peninsular India from time immemorial. *X. cheopis* is now well established in heavily plague infected northern plains of India, but there are large tracts of territory near the coast of the Bay of Bengal which are still comparatively free from this dangerous parasite and also from plague.

The Fifth Section of Part II. of the Memoir deals briefly with other factors governing the spread of plague, such as climate, rat population, communications with infected regions, and housing conditions. Climate operates principally by its effect on flea numbers and on the length of survival and general activity of the plague infected flea when separated from its host. This factor is, therefore, essentially parasitological.

The same is true to a large extent, even of the factor of communications. Thus grain is a most important vehicle for the transference of plague infection from regions where the rats are infested with large numbers of *X. cheopis*, but the traffic in grain from areas where *C. fasciatus* greatly predominates, such as the interior of Europe or North America, is innocuous *qua* plague, despite the high rat population of the granaries. Similarly, the distribution of rice from Rangoon, where large numbers of *X. cheopis* are now found, is associated with outbreaks of plague, but the rice growing districts with a pure *astia* flea population, such as the lowlands of Madras, are not a source of plague infection.

The final section of the Memoir deals with the application of the results of recent research to plague preventive work.

Here again Colombo affords the best example of the successful application of the new ideas.

Thus, the completion of the rat flea survey of Colombo in 1924 made it possible to demarcate the potentially plague infected zones. During the off-plague seasons of 1924 and 1925 and 1926 all available methods for rat and flea destruction were concentrated on the zones. The number of human cases of plague during 1925 fell to 62, the lowest figure recorded since plague broke out. In 1926 there was a further fall to 13 cases, while for five months no case of human plague was detected in the town and for seven months no case of rat plague, in spite of an intensive search during July and August.

*Seasonal Prevalence of Rat Fleas in Endemic Plague Area.*

1925.

Month.	Rats.	Fleas.	Astia.	Cheopis.	Per Cent. Cheopis.	Flea Index.	Cheopis Index.
January	212	497	438	59	11.9	2.34	.28
February	132	436	405	31	7.1	3.30	.23
March	178	593	488	86	14.5	3.33	.48
April	119	278	238	37	13.4	2.31	.31
May	92	304	255	49	16.1	3.30	.53
June	101	279	201	78	27.9	2.76	.77
July	118	326	253	72	22.1	2.75	.61
August	146	434	296	138	31.8	2.97	.94
September	128	361	283	78	21.6	2.82	.61
October	152	433	380	53	12.2	2.85	.35
November	109	282	232	50	17.7	2.59	.46
December	79	132	83	49	37.1	1.66	.62

1926.

Month.	Rats.	Fleas.	Astia.	Cheopis.	Per Cent. Cheopis.	Flea Index.	Cheopis Index.
January	170	354	316	38	10.73	2.08	.22
February	122	273	230	43	15.75	2.24	.35
March	141	340	306	34	10.00	2.41	.24
April	102	239	204	35	10.46	2.34	.34
May	159	402	370	32	7.96	2.53	.20
June	254	1,092	990	102	9.3	4.29	.40
July	302	1,113	939	174	15.6	3.69	.59
August	114	390	333	57	14.62	3.42	.50
September	224	408	325	83	20.34	1.82	.37
October	161	476	403	73	15.34	2.95	.45
November	148	485	439	46	9.48	3.28	.31
December	91	247	208	39	15.79	2.71	.43

*Recent Observations on Rat Flea Prevalence Outside the Plague Area.*

Slave Island District, 1926.

Month.	Rats.	Fleas.	Astia.	Cheopis.	Per Cent. Cheopis.	Flea Index.	Cheopis Index.
April	207	533	520	13	2.49	2.57	0.06
May	240	369	361	8	2.21	1.54	0.03
June	271	783	773	10	1.3	2.89	0.04
July	198	645	597	48	7.48	3.26	0.04
November	272	891	842	49	5.5	3.27	0.18
December	112	387	358	29	7.5	3.45	0.26

Mutwal and Kotahena, 1926.

Month.	Rats.	Fleas.	Astia.	Cheopis.	Per Cent. Cheopis.	Flea Index.	Cheopis Index.
January	209	236	233	3	1.27	1.13	0.01
February	239	281	277	4	1.42	1.18	0.02
March	210	396	389	7	1.76	1.89	0.03
April	375	666	661	5	0.75	1.78	0.02
May	424	968	966	2	0.20	2.29	0.005

The above figures apply to fleas caught on *Rattus rattus kandianus*.EFFECT OF THE EFFLUENT FROM THE MADAMPITIYA TREATMENT WORKS  
ON THE KELANI RIVER.

After a lapse of several years a favourable opportunity presented itself for investigating the bacteriological state of the Kelani river under conditions of maximum upstream pollution from the outfall of the sewage works, i.e., when a strong tide flowing up a low river reverses the current so that the effluent is carried upwards and outwards towards the opposite side of the river below Victoria bridge.

Fortunately, well marked conditions of this kind occur comparatively rarely.

During the short time that they prevail the effluent becomes a possible source of enteric and dysenteric infection to inhabitants of the opposite bank, some of whom are in the habit of drawing water direct from the river.

The effect of the effluent was discernible to the naked eye as far as the banks just below Victoria bridge opposite the outfall. Bacteriologically there was evidence of added pollution of the river water some 50 yards above the bridge. Under these conditions the sewage effluent accumulates in front of the outfall for several hours before the turn of the tide when it is swept away towards the sea.

No further outbreaks of enteric traceable to the sewage works have been reported below the outfall. Another and more complete set of observations have been taken under conditions for maximum downstream pollution. The results confirmed the previous finding, viz., that when the river is flowing strongly downstream the effluent flows along the Colombo banks of the river in a well defined stream, effective dilution of sewage with river water only taking place some 600 yards below the outfall.

A full report of the various findings, illustrated with maps, was issued during the year.

Warnings have been issued and notices posted prohibiting the use of the dangerously polluted river water.

## HOOKWORM DISEASE.

Further observations have been made on hookworm infestation of the sewage works in Colombo and of the new sewage disposal plant at Angoda Asylum, with the kind co-operation of the Director of Anchyllostomiasis Campaigns in the former instance and of the officers of the Public Works Department in charge of the Asylum plant in the latter. I hope to publish a detailed report of the results of some of these investigations in due course.

Nine additional samples of sludge from the sums of sewage pumping stations have been examined this year, making twenty-two in all. It is now clear that the presence of hookworm or other penetrative nematode larvae in such sludge is quite exceptional.

There have been no further outbreaks of hookworm dermatitis among the coolies engaged in clearing out these sums, such as that described in the Report for 1923. A few similar cases have occurred among the underground sewer labour force. As far as I know these are the first instances of hookworm disease attributable to occupation in a tropical water carriage sewage works.

The question arises as to how these penetrative larvae gain access to such situations as the sums of pumping stations and the interior of sewers. Hookworm ova may retain their viability for a period of several weeks in sewage, but they will not develop in a fluid medium so deficient in dissolved oxygen. A free supply of oxygen is essential for the development of hookworm ova to the larval stage.

A few of the larvae found may develop outside the sewage disposal works on such situations as the sides of latrine buckets, but I think the majority are probably derived from eggs deposited on the sides of imperfectly flushed sewers subject to a variable flow.

I have examined large amounts of scrapings taken from the walls of main sewers above the customary level of the sewage but with negative results so far.

Numerous nematode larvae have been found but none of them were morphologically similar to *Necator americanus*, or if they did bear a superficial resemblance, they failed to pass the physiological tests I am accustomed to use as a criterion for larvae of the penetrative type.

Here again the comparative infrequency of hookworm dermatitis among the large staff of underground sewer coolies indicates that the presence of infective larvae is exceptional.

Hookworm stool egg counts by the Stoll technique have been done on 295 of the Council's employees in the various divisions of the sewage works.

The results may be summarized as follows :—

	Number examined.	Per Cent. infected.	Average Number of Hookworm Eggs per Gramme of soft formed stool.
Pumping station coolies	... 144	... 93	... 702
Underground sewer coolies	... 83	... 88	... 854
Trench coolies	... 68	... 93	... 486

These figures represent a low degree of hookworm infestation. On a very rough average each egg-laying *Necator americanus* in the human intestine lays about twenty-five eggs per gramme of soft formed stool. The above figure corresponds, therefore, to between 20 to 35 worms per man, a number which is insufficient to produce definite symptoms of hookworm disease in an average individual. The highest individual count showed less than 10,000 eggs per gramme. There were only four counts of over 3,000 per gramme.

The observations on the Angoda sewage disposal plant are particularly interesting. It consists of a series of three circular sedimentation tanks of the Emscher pattern arranged in series, the final effluent being passed on to a coarse rubble bed before discharge into a stream.

These tanks are fitted with inclined baffle plates which divert the gases evolved from the decomposing sludge deposited in the conical sum in such a manner that particles such as hookworm eggs can sediment properly from the fluid at the periphery of the tanks without being exposed to the disturbing effect of the violent ebullition which goes on throughout a plain septic tank working under tropical conditions and which greatly interferes with the effective sedimentation of all kinds of suspended matter. The following are the results of a preliminary series of test on the unripened tanks as regards hookworm ova present in the effluents :—

Crude sewage passing into No. 1 Tank	...	127	} Hookworm eggs over 100 per C.C.
Effluent from First Tank	...	20	
Effluent from Second Tank	...	5	
Effluent from Third Tank	...	5	
Final Effluent	...	1	

Observations on the fully ripened tanks and on the viability of the numerous hookworm ova trapped in the sludge of the tanks are now in progress.

A group of 122 human faeces from the Kotahena district yielded 61 infected specimens by the Clayton Lane direct centrifugal floatation method, approximate egg count per gramme of soft formed stool 96. The corresponding figures for a group of 106 Slave Island specimens selected at random showed 63 infected and an egg count of 171 per gramme of soft formed stool. These figures represent a very low rate of infestation. Among 755 specimens collected from houses in the slum areas and examined by the Stoll technique at the laboratory of the Director of Anchyllostomiasis Campaigns 567 were infected, i.e., 75·1 per cent. and the average egg count was 505.

## THE COLOMBO WATER SUPPLY.

Experiments have been made this year on screens filled with broken coral submerged in the straining shaft of the Labugama reservoir. Such screens require frequent washing. The engineering difficulties in the way of lifting the large number of screens required to reach the bottom of the straining shaft proved to be too considerable for practical routine work.

It would seem that it is impracticable to aerate or prefilter the Labugama water without radical reconstruction of the present treatment works at prohibitive expense. It will be necessary to fall back on the direct addition of the active substances to the water in the settling tanks. Thus the excessive acidity which the water develops at low levels of the reservoir can be neutralized by adding an appropriate dose of whiting. The chemical action will be equivalent to that obtained by the use of the coral screens which have given successful results experimentally. The filters could be operated much more efficiently with slightly alkaline water and the excess of iron could be more easily eliminated.

Some additional observations have been made on the nature of the incrustation with a view to determine what part, if any, was played by the iron of the pipes.

Colombo water will produce a definite incrustation on the walls of a smooth glass pipe through which it is caused to flow continuously. But there is reason to believe that the crust formed on the anticorrosive varnish of mains manufactured of iron and steel is both harder and thicker than that deposited on non-ferruginous materials such as wood or concrete.

The results of recent laboratory experiments with Colombo water indicate that blistering of the protective coat and slight corrosion of the iron beneath may sometimes take place, in which case part of the iron in the oxides of the crust may be derived from the pipe itself rather than the water. The blistering is probably due to water gaining access to the pipes through minute faults in the protective coating.

This question of the precise source of the iron entering into the incrustation is the subject of much investigation at the present time at other waterworks.

Recent observations open up a fresh field of inquiry regarding the utility of such anticorrosive substances as sodium silicate for preventing iron incrustation. I hope to get into touch with recent developments when on leave this year.

An unusually complete series of bacteriological tests were carried out under dry weather conditions in 1926. Chemical tests of duplicate samples were performed by the City Analyst.

The details of the great variety of observations which have been carried out from time to time in recent years on the microbiology of the water supply will be reported when a final set of observations have been made after the completion of the filtration plant.

The results of the bacteriological survey carried out in 1913 were reported in an address to the Third All-India Sanitary Conference at Lucknow and published in the Indian Journal of Medical Research. In 1915, I made the preliminary observations on the nature of the incrustation. In 1920 to 1921 the organisms producing the incrustation of the pipes and the suspended matter in the free filtered water were identified, with the help of experts at the British Museum, Kew, and Dr. David Ellis.

I also worked out a laboratory method of preventing the incrustation and carried out a series of tests on the operation of the Jewell filters (see annual Reports for 1920 and 1921).

The work was interrupted during the raising of the dam.

The City Analyst, the Waterworks Engineer, and myself are now trying to evolve the most practicable and economical means of applying the results of the bacteriological and chemical observations and experiments to the treatment of the whole supply.

L. F. HIRST,  
City Microbiologist.

March 11, 1927.

*Annexure B.*

REPORT OF THE CITY ANALYST FOR 1926.

In answer to your letter No. 80 of the 10th instant, I have the honour to send my Annual Report for the year 1926.

<i>January.</i>			<i>May.</i>			<i>September.</i>		
Milks	...	96	Milks	...	93	Milks	...	102
Town water	...	16	Town water	...	18	Town water	...	16
Concrete blocks	...	9	Well water	...	1	Well water	...	2
Water from Wharf	...	5	Vinegar	...	1	<i>October.</i>		
<i>February.</i>			<i>June.</i>			Milks	...	99
Milks	...	98	Milks	...	100	Town water	...	16
Town water	...	16	Town water	...	16	<i>November.</i>		
Well water	...	1	Well water	...	1	Milks	...	91
<i>March.</i>			<i>July.</i>			Town water	...	16
Milks	...	93	Milks	...	99	Well water	...	3
Town water	...	16	Town water	...	16	<i>December.</i>		
Well water	...	1	<i>August.</i>			Milks	...	103
Labugama water	...	4	Milks	...	93	Town water	...	16
<i>April.</i>			Town water	...	16	Well water	...	2
Milks	...	96	Well water	...	4	Total	...	<u>1,391</u>
Town water	...	16						

A total number of 1,391 samples were examined during the year.

Total number of milks	...	...	...	1,163
Total number of well water				15
Total number of town water				194
Total number of water from Labugama reservoir				4
Total number of water from distributing pipes at the Wharf...				5
Total number of concrete blocks				9
Total number of vinegar				1
Total	...			<u>1,391</u>

*Milk supply.*—Of a total of 1,163 samples taken, 755 were passed as being up to standard and 408 considered adulterated by the addition of water. Of these, 274 samples or 23·6 per cent. were found to have 1-10 per cent. added water, 83 samples or 7·1 per cent. from 11-30 per cent. added water, and 51 or 4·4 per cent. had over 30 per cent. added water. The maximum adulteration found was 69 per cent. from Maradana North Ward.

The first quarter of 1926 shows a decided improvement on last year's figures and the second quarter's figures show a greater number of adulterated samples but the adulteration above 11 per cent. has been less extensive.

The third and fourth quarters are decidedly worse than the same periods in 1925, especially in the third quarter where adulteration over 31 per cent. amounts to 6·4 per cent. of the total.

Table 1.

*Adulteration of Milk.*

Month	Total No.	0 Per Cent.	1-10 Per Cent.	11-30 Per Cent.	+ 31 Per Cent.	Maximum.
January	96	70·8	18·8	8·3	2·1	53
February	98	69·4	16·3	8·2	6·1	49
March	93	74·2	20·4	3·2	2·2	53
April	96	63·5	25·0	7·3	4·2	49
May	93	61·3	29·0	7·5	2·2	69
June	100	55·0	33·0	9·0	3·0	59
July	99	59·6	22·2	10·1	8·1	55
August	93	66·7	24·7	5·4	3·2	49
September	102	65·7	20·6	5·9	7·8	60
October	99	67·7	19·2	9·1	4·0	67
November	91	67·0	25·3	3·3	4·4	49
December	103	59·2	28·2	7·8	4·8	57

Table 2.

## 1925.

	0 Per Cent.	1-10 Per Cent.	11-30 Per Cent.	+ 31 Per Cent.
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First quarter	56·3	22·5	12·6	8·4
Second quarter	64·3	19·8	8·9	6·7
Third quarter	67·5	21·2	6·5	4·8
Fourth quarter	76·8	18·1	4·5	0·7

## 1926.

	0 Per Cent.	1-10 Per Cent.	11-30 Per Cent.	+ 31 Per Cent.
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First quarter	71·5	18·5	6·6	3·5
Second quarter	59·9	29·0	7·9	3·1
Third quarter	64·0	22·5	7·1	6·4
Fourth quarter	64·6	24·2	6·7	4·4

The city water supply shows the same high standard of purity. 194 samples were examined from different stand pipes in the city, 4 from Labugama reservoir, and 5 from the distributing pipes at the Wharf.

Fifteen samples of well water were tested, of which 10 were returned as suspicious and 5 were condemned. During January, 9 sample concrete blocks were examined and found satisfactory.

One sample of vinegar was tested and returned as fit for human consumption although a little low in acetic acid.

The Laboratory, Hyde park corner,  
Colombo, February 11, 1927.

A. E. PURVES,  
for City Analyst.





